

South Dakota Approved Resource Management Plan

Attachment II

From the Record of Decision and Approved Resource Management Plan Amendments for the Rocky Mountain Region including the Greater Sage-Grouse Sub-Regions of: Lewistown, North Dakota, Northwest Colorado, and Wyoming and the Approved Resource Management Plans for: Billings, Buffalo, Cody, HiLine, Miles City, Pompeys Pillar National Monument, South Dakota, and Worland

Prepared by
US Department of the Interior
Bureau of Land Management
South Dakota Field Office

September 2015



MISSION STATEMENT

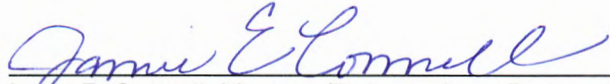
The BLM manages more than 245 million acres of public land, the most of any Federal agency. This land, known as the National System of Public Lands, is primarily located in 12 Western states, including Alaska.

The BLM also administers 700 million acres of sub-surface mineral estate throughout the nation. The BLM's mission is to manage and conserve the public lands for the use and enjoyment of present and future generations under our mandate of multiple-use and sustained yield. In Fiscal Year 2014, the BLM generated \$5.2 billion in receipts from public lands.

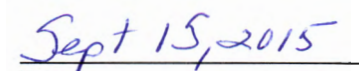
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State Director Recommendation for Approval

I hereby recommend for approval the South Dakota Resource Management Plan.



Jamie E. Connell, Montana/Dakotas State Director



Date

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ACRONYMS AND ABBREVIATIONS

Full Phrase

ACEC	area of critical environmental concern
AML	abandoned mine land
AMP	allotment management plan
AO	Authorized Officer
APHIS/PPQ	Animal and Plant Health Inspection Service/Plant Protection and Quarantine
APD	application for permit to drill
ARMP	approved resource management plan
AUM	animal unit month
BAER	burned area emergency rehabilitation
BHAD	Black Hills Army Depot
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practice
BSU	biologically significant unit
CEQ	White House Council on Environmental Quality
CFR	Code of Federal Regulations
cm	centimeter
COA	condition of approval
COT	USFWS Conservation Objectives Team Report (sage-grouse)
CRMP	cultural resource management plan
CSU	controlled surface use
CWPP	community wildfire protection plan
CX	categorical exclusion
DBH	diameter at breast height
DDCT	density and disturbance calculation tool
DLE	desert land entry
EA	environmental assessment
EE/CA	Engineering Evaluation/Cost Analysis
EIS	environmental impact statement
ESA	Endangered Species Act
ESD	ecological site description
ESIS	Ecological Site Information System
FEIS/Final EIS	final environmental impact statement
FLPMA	Federal Land Policy and Management Act
FRCC	fire regime condition class
GHG	greenhouse gas
GHMA	greater sage-grouse general habitat management area(s)
GRSG	Greater Sage-grouse
HAF	habitat assessment framework
I Allotment	improve category grazing allotment
IM	instruction memorandum
IPM	integrated pest management
kV	kilovolt

ACRONYMS AND ABBREVIATIONS *(continued)*

Full Phrase

M Allotment	maintain category grazing allotment
MD	management decision
MRB survey	Missouri River Basin Survey (livestock stocking rates)
NEPA	National Environmental Policy Act
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NOA	notice of availability
NOI	notice of intent
NO _x	nitrogen oxides
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSHT	National Scenic and Historic Trails
NSO	no surface occupancy
O&G	oil and gas
OHV	off-highway vehicle
PA	programmatic agreement
PFC	proper functioning condition
PFYC	potential fossil yield classification
PHMA	greater sage-grouse priority habitat management area(s)
PSQ	probable sale quantity
R&PP	recreation and public purposes
RAC	Resource Advisory Council (Dakotas)
RCA	reserve common allotment
RDF	required design feature
RMP	resource management plan
ROD	record of decision
ROW	right-of-way
RSC	recreational setting characteristics
RUP	recreation use permits
SDGFP	South Dakota Game, Fish, and Parks
SDFO	South Dakota Field Office (BLM)
SFA	sagebrush focal area(s)
SHPO	State Historic Preservation Office
SMA	Surface Management Agency
SOP	standard operating procedures
SRMA	special recreation management area
SRP	special recreation permit
SRUP	special recreation use permits
T&E	threatened and endangered (ESA)
TCP	traditional cultural property
TL	timing limitation
TMA	travel management area
THPO	Tribal Historic Preservation Office

ACRONYMS AND ABBREVIATIONS *(continued)*

Full Phrase

USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VRM	visual resource management
WAFWA	Western Association of Fish and Wildlife Agencies
WEM	waivers, exceptions, and modifications
WO	Washington Office, Bureau of Land Management
WUI	wildland urban interface

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CHAPTER I

INTRODUCTION

The United States Department of the Interior (USDI), Bureau of Land Management (BLM) prepared this Approved Resource Management Plan (ARMP). It is intended to provide direction for managing the National System of Public Lands (herein BLM-administered lands) under the jurisdiction of the South Dakota Field Office (SDFO). The regulations for making and modifying land use plan decisions, which comprise a resource management plan (RMP), are found in 43 Code of Federal Regulations (CFR), Part 1600.

Land use plan decisions consist of desired outcomes (goals and objectives) and allowable uses and management actions. The affected lands are currently being managed under the South Dakota RMP (BLM 1986). This ARMP replaces the land use plan decisions from the 1986 South Dakota RMP.

Land use planning is used to manage resources and to designate uses on public lands, in coordination with tribal, state, and local governments, land users, and the interested public. This ARMP incorporates new information and regulatory guidance, and provides management direction where it may be lacking or requires clarification. Current management direction that is effective and requires no change is carried forward into this ARMP.

This ARMP has been revised according to guidance in the Federal Land Policy and Management Act (FLPMA) of 1976 (43 United States Code [USC], Section 1701 et seq.) and the BLM's Land Use Planning Handbook, H-1601-1. An environmental impact statement (EIS) was completed and incorporated in the Draft RMP (BLM 2013) and Proposed RMP (BLM 2015), as required by the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR, Parts 1500-1508), and requirements of the BLM's NEPA Handbook, H-1790-1 (BLM 2008).

I.1 DESCRIPTION OF THE PLANNING AREA

The BLM's SDFO headquarters is in Belle Fourche in Butte County, near the state's western border. The planning area for the SDFO and this ARMP covers the entire state of South Dakota, which includes over 49 million acres of public, private, and state lands, and Native American reservations (refer to **Appendix A2: Map A**). Within the planning area, the BLM administers about 274,000 acres of public

land surface and approximately 1.7 million acres of federal mineral estate in 37 counties. **Table I-1** identifies BLM-administered acres and total acres in the planning area by county. Collectively, lands that the BLM administers (surface and mineral estate) are considered the decision area.

Over half of the BLM-administered surface estate in the planning area is in Butte County. (Refer to **Figure I-1** to see BLM-administered surface and split-estate in Butte and Harding Counties.) Over 98 percent of surface and subsurface estate managed by BLM in the planning area is in western South Dakota, with most in Custer, Fall River, Harding, Butte, Lawrence, Meade, Pennington, Perkins, and Stanley Counties. (Refer to **Appendix A2**, Maps A and B.)

This RMP will provide guidance for leasing decisions for federal oil and gas resources managed by the BLM and only those federal surface management agencies (SMA) with which the BLM has an agreement for oil and gas leasing. There are no sage grouse focal areas (SFA) identified in South Dakota.

Leasing decisions for federal oil and gas resources not managed by the BLM will be made by an SMA, in cooperation with the BLM. The BLM will not issue federal oil and gas leases without consulting with the SMA. Examples of agencies that fall under this category in South Dakota are the US Army Corps of Engineers and the Bureau of Reclamation.

This document provides stipulations for split-estate situations involving federal oil and gas beneath private, Recreation & Public Purpose patented, or state-owned surface. The BLM will apply the leasing stipulations recommended by the agency whose land is being leased. The BLM may add other stipulations it deems necessary.

This RMP does not apply to lands managed by the US Department of Agriculture (USDA), Forest Service (Forest Service), USDI, National Park Service (NPS), US Fish and Wildlife Service (USFWS), Bureau of Indian Affairs (BIA) trust lands, tribal lands, or private or state-owned mineral resources.

The Forest Service makes decisions on its own lands, although the BLM leases minerals under Forest Service-administered surface. The BLM is a cooperator or joint lead on plans with the Forest Service and makes decisions on leasing federal minerals underlying private surface within the Forest Service administrative boundary. The BLM has done this and prepared records of decision (RODs) for the Buffalo Gap (USFS 2000) and Custer National Forest, Sioux Ranger District Plan (USFS 2004), but not the Black Hills National Forest Plan.

While the BLM has been a cooperator on various Forest Service plans, for purposes of efficiency, the BLM can address federal minerals in its own plans within the administrative boundary of the Forest Service. The BLM has found a need to do so in this case for the town site of Igloo and the Abandoned Black Hills Army Depot (BHAD; refer to **Section 3, Figure 3-1**). Accordingly, this ARMP provides management direction for the federal minerals that underlie private surface estate at this site even though it is within the administrative boundaries of the Buffalo Gap National Grassland. The BHAD and Igloo are eligible for listing as National Register Historic Sites. The BHAD also has had issues with hazardous materials being inadequately handled and disposed of on-site, resulting in some Superfund actions. The Forest Service has not addressed these concerns in its plans.

Table I-1
BLM-Administered Land and Federal Mineral Estate Ownership in the Planning Area

County	BLM-Administered Public Lands		BLM-Administered Federal Mineral Estate (Split-Estate)	
	Acres	Percent of County	Acres	Percent of County
Bennett	0	0	2,878	<1
Bon Homme*	56	<1	58	<1
Brule*	532	<1	947	<1
Butte	144,641	10	536,606	37
Campbell*	0	0	2,255	<1
Charles Mix*	122	<1	258	<1
Clark*	0	0	167	<1
Clay*	11	<1	11	<1
Corson	0	0	40,756	<1
Custer	3,693	<1	68,140	7
Dewey	0	0	8,264	<1
Edmunds*	0	0	625	<1
Fall River	7,205	<1	60,532	5.4
Faulk*	0	0	480	<1
Gregory	172	<1	1,866	<1
Haakon	2,178	<1	46,111	4
Hand*	0	0	362	<1
Harding	30,261	1.7	377,328	22
Hughes*	2	<1	500	<1
Hyde*	0	<1	1,285	<1
Jackson	240	<1	4,396	<1
Jones	3	<1	1,107	<1
Lawrence	5,078	1	7,038	1.4
Lyman	225	<1	399	<1
Marshall*	20	<1	20	0
McPherson*	0	0	360	<1
Meade	38,997	1.7	276,774	12
Mellette	0	0	1,612	<1
Pennington	16,088	<1	82,177	5
Perkins	7,973	<1	76,346	1
Potter*	0	0	159	<1
Stanley	15,922	1.7	111,833	12
Sully*	80	<1	1,331	<1
Tripp	160	<1	316	<1
Walworth*	0	0	1,819	<1
Yankton*	359	<1	359	<1
Ziebach	202	<1	202	<1
Totals	274,239	-	1,715,677	-

Source: US Bureau of Census and BLM 2009

The acreages may not be identical to other sources because these acreages are based on geographical information system (GIS) data. Additional counties may have small amounts of BLM-administered lands, but the acres may not be listed because of incomplete records. Decisions in this ARMP apply to all BLM-administered lands and mineral estate in South Dakota.

*South Dakota counties east of the Missouri River.

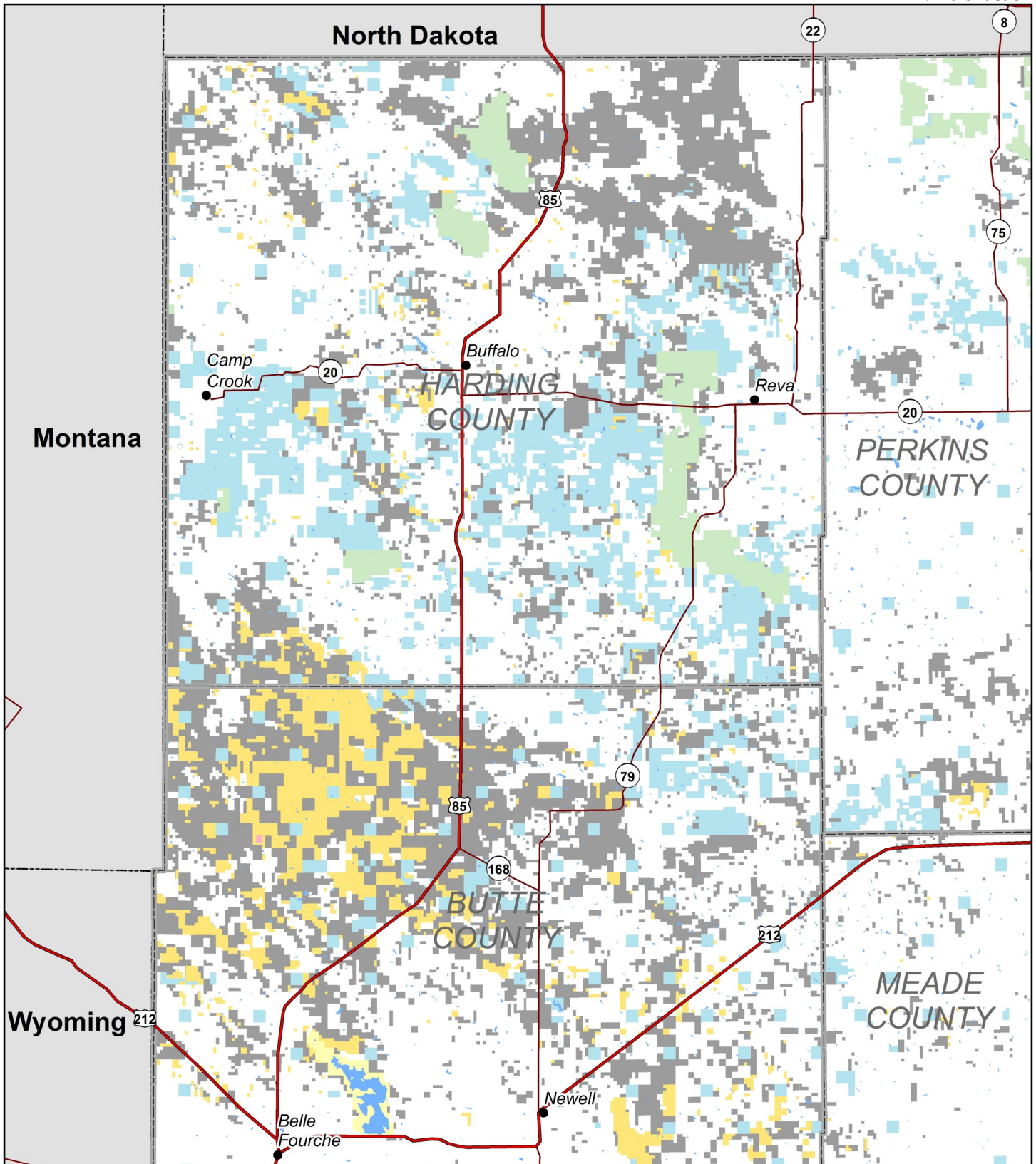


Figure 1-1: South Dakota Planning Area, Surface Management and Sub-Surface Estate

- | | |
|--|--|
| Bureau of Land Management | State/Local |
| U.S. Forest Service | Private/Other |
| Bureau of Reclamation | Water |
| Department of Defense | Non-Federal Surface, Federal Sub-Surface |
| | Planning Area Boundary |
| | State Boundary |



0 5 10 Miles

September 2015



No warranty is made by the Bureau of Land Management (BLM). The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

The boundary for the BHAD and the town site of Igloo is demarcated by the Forest Service administrative boundary map for this ARMP. However, there are some issues and discrepancies with legal descriptions and boundary lines, which may necessitate referencing and using master title plats, as modified by the most current cadastral survey.¹

The NPS and USFWS-administered lands are not subject to leasing under the Mineral Leasing Act of 1920. However, if oil or gas is being drained from lands otherwise unavailable for leasing, there is implied authority to lease that oil and gas resource. The BIA leases the lands that it administers, and tribes also do their own leasing; these actions do not fall under this ARMP.

Most of the BLM-administered public lands (surface estate) are in western South Dakota (**Appendix A2**, Map A). Butte County contains 144,641 acres of BLM-administered land, or 53 percent of the total BLM-administered land, and 536,606 acres (37 percent) of the federal mineral estate in the planning area. Other counties with substantial amounts of BLM-administered land are also in western South Dakota: Custer, Fall River, Harding, Lawrence, Meade, Pennington, Perkins, and Stanley Counties. Tracts of BLM-administered land in these counties generally range in size, but most are between 40 and 320 acres intermingled with state and private lands.

Nine counties east of the Missouri River contain small tracts of BLM-administered land: Bon Homme, Brule, Campbell, Charles Mix, Clay, Hughes, Marshall, Sully, and Yankton Counties. Most of the BLM-administered land in eastern South Dakota are along the Missouri River and were flooded when reservoirs were built on the river in the 1940s and 1950s. Eastern South Dakota counties with federal minerals (split-estate) are also identified in **Table I-1**. In some cases, ownership of small tracts are unknown or undetermined. Decisions in this ARMP will apply to these lands if in the future they are determined to be BLM-administered surface or split-estate.

Lands managed by the SDFO are public domain (lands that have never left federal ownership), acquired lands or mineral interests (lands that left federal ownership and were later exchanged for or purchased), and federal mineral estate (subsurface) lands beneath private or state lands or lands administered by other federal agencies. Federal minerals included in the decision area are shown in **Figure I-3**. The BLM does not administer land obtained through the Bankhead-Jones Act of 1935 in South Dakota; those parcels are administered by the Forest Service.

The BLM will continue to coordinate with other federal and state agencies, especially for those resources and issues that cross boundaries.

I.2 PURPOSE AND NEED

The purpose of this ARMP is to provide a single, comprehensive land use plan to guide management of public lands and minerals administered by the SDFO. It provides goals, objectives, land use allocations, and management direction to maintain, improve, or restore resource conditions and to provide long-term benefits to the public, including the economic needs of local communities. This was done in coordination with federal, tribal, state, and local governments, land users, and the interested public.

¹ A cadastral survey shows the ownership, size, and valuation of a property for taxation.

This ARMP revision incorporates appropriate management actions and practices to conserve Greater Sage-Grouse (GRSG; *Centrocercus urophasianus*) and its habitats on BLM-administered land.

The need for the revision is the result of considerable changes within the planning area since completion of the South Dakota RMP in 1986, as follows:

- Changed ecological, socioeconomic, institutional, and regulatory conditions
- New laws, regulations, and policies that invalidate or supersede previous decisions
- Changing user demands and activities, including increased demand for recreation on public lands, renewable energy, and oil and gas exploration and development
- Increased conflicts between land use and wildlife and its habitat
- Heightened public awareness of and interest in BLM management actions and permitted uses

This ARMP was also prepared to incorporate consistent objectives and conservation measures for managing GRSG habitat. These conditions also drive the need for an inclusive comprehensive plan that provides updated and clear direction to both the BLM and the public. The ARMP incorporates appropriate management actions and practices to conserve, enhance, and restore GRSG habitat on BLM-administered land.

The BLM has prepared this ARMP for plans containing GRSG habitat. This is needed to respond to the USFWS's March 2010 "warranted, but precluded" Endangered Species Act (ESA) listing decision. The inadequacy of regulatory mechanisms was identified as a significant threat in the finding. The USFWS identified the principal regulatory mechanisms for the BLM and the Forest Service as conservation measures embedded in land use plans. Changes in management of GRSG habitats are necessary to avoid the continued decline of populations across the species' range. This ARMP focuses on areas affected by threats to GRSG habitat identified by the USFWS in the March 2010 listing decision and in the USFWS Conservation Objectives Team (COT) report (USFWS 2013).

The major threats to GRSG and its habitat on BLM-administered lands in the planning area are shown in **Tables 2-3** and **2-4** in **Section 2**. One of the purposes of this ARMP is to identify and incorporate appropriate conservation measures in existing land use plans to conserve, enhance, and restore GRSG habitat by reducing, eliminating, or minimizing threats. The BLM will consider such measures in the context of its multiple use and sustained yield mandates under FLPMA.

Because the BLM administers a portion of GRSG habitat in the affected states, changes in GRSG habitat management are anticipated to have a considerable beneficial impact on present and future GRSG populations. These conditions drive the need for an inclusive comprehensive plan that provides updated, clear direction to the BLM, other agencies and entities, and the public.

I.3 PLANNING CRITERIA

BLM regulations (43 CFR, Part 1610.4-2) require planning criteria to guide RMP preparation. These are the constraints or ground rules that guide and direct the development of the RMP. They ensure that it is tailored to the identified issues and that unnecessary data collection and analyses are avoided.

The following criteria were developed based on applicable laws and regulations, agency guidance, and public comment:

- The RMP addresses BLM-administered public lands and federal minerals. Decisions will not be made for lands not managed by the BLM.
- The RMP is in compliance with FLPMA and all other applicable laws, regulations, and policies.
- Impacts from the management alternatives considered in the RMP will be analyzed in the EIS and developed in accordance with regulations at 43 CFR, Part 1610, and 40 CFR, Part 1500.
- Broad-based public participation would be an integral part of the RMP planning and EIS process.
- Decisions in the RMP would strive to be compatible with existing plans and policies of adjacent local, state, tribal, and federal agencies, as long as the decisions are consistent with the purposes, policies, and programs of federal law and regulations applicable to BLM-administered lands.
- The RMP would continue to recognize the State of South Dakota's responsibility and authority to manage wildlife. The BLM would consult with South Dakota Game, Fish, and Parks (SDGFP) as necessary. The RMP would incorporate state or region-wide planning efforts to the fullest extent possible.
- The National Sage-Grouse Habitat Conservation Strategy (BLM 2004) requires that impacts on sagebrush habitat and sagebrush-dependent wildlife species (including GRSG) be analyzed and considered in BLM land use plans for BLM-administered lands with GRSG/sagebrush habitats. In 2010, the USFWS found GRSG to be warranted but precluded from listing as an endangered species.
- The BLM will use the Western Association of Fish and Wildlife Agencies (WAFWA) Conservation Assessment of Greater Sage-Grouse and Sagebrush Habitats (Connelly et al. 2004), and any other appropriate resources (e.g., peer-reviewed scientific literature, internal documents or guidance, other state or federal agencies, and expert opinion), to identify GRSG habitat requirements and best management practices (BMPs). WAFWA management zones will be used to identify and address cross-state issues, such as regional mitigation and adaptive management monitoring response, through WAFWA Management Zone GRSG Conservation Teams (Teams). These Teams will convene and respond to issues at the appropriate scale, and will utilize existing coordination and management structures to the extent possible.
- The RMP will recognize valid existing rights.
- The RMP will incorporate management decisions brought forward from existing planning documents.
- The RMP/EIS will incorporate by reference the Montana/Dakotas Standards for Rangeland Health and Guidelines for Livestock Grazing Management, the Montana/Dakotas Fire/Fuels Management Plan, and the Off-Highway Vehicle EIS and Plan Amendment for Montana, North Dakota, and Portions of South Dakota.

- Based on the assumptions of adequate funding, the BLM will periodically review and amend this plan if necessary. Plans would be evaluated every five years, in accordance with 43 CFR, Part 1610.4-9. Information gathered from the five-year evaluation would be used to determine planning needs and priority for plan revisions and amendments.
- The interdisciplinary planning team will cooperate and collaborate with the State of South Dakota, tribal governments, county and municipal governments, other federal agencies, the Dakotas Resource Advisory Council (RAC), and all other interested groups, agencies, and individuals.
- The RMP will recognize federal land management agency obligations under tribal treaties and laws or executive orders (EO) on Native American reserved rights, religious freedoms, and traditional use areas.
- The BLM and cooperating agencies and governments will jointly develop alternatives to resolve resource management issues that are within the BLM's authority.
- The BLM will consult the State Historic Preservation Office (SHPO), who will be involved throughout the planning process.
- Areas with special environmental quality will be protected and, if necessary, designated as area of environmental concern (ACEC), Wild and Scenic River, or other appropriate designations.
- The RMP will emphasize protection and enhancement of biodiversity in the planning area, while providing the public with opportunities for compatible activities on BLM-administered lands.
- The RMP will recognize local, statewide, and national concerns and lifestyles.
- The BLM will manage lands it acquires in the manner the RMP prescribes for adjacent or nearby BLM-administered land, subject to any constraints associated with the acquisition.
- The RMP will provide management direction for lands returned to BLM management through any revocation of withdrawals. The plan would also address lands acquired through other means.
- Fire management strategies will be consistent with the 2009 Guidance for Implementation of Federal Wildland Fire Management Policy, the National Fire Plan, the Fire/Fuels Management Plan for Montana and Dakotas, the Interagency Prescribed Fire Planning and Implementation Procedures Guide with BLM supplemental guidance, the Interagency Standards for Fire and Fire Aviation Operations (Redbook), and other BLM handbooks.
- GIS and metadata information will meet Federal Geographic Data Committee standards, as required by EO 12906, signed April 11, 1994. Other applicable BLM data standards will be followed. The goal is to develop an RMP with spatial and temporal data that can be easily accessed for use in subsequent environmental review.
- All proposed management actions will be based on best available scientific information, research and technology, and existing inventory and monitoring information.
- The RMP will establish new guidance and identify existing guidance that the BLM will rely on in managing public lands in the decision area.

- The RMP will result in determinations as required by special program and resource-specific guidance in Appendix C of the BLM's Land Use Planning Handbook (BLM 2005a).
- Resource allocations must be reasonable and achievable within available technological and budgetary constraints.
- The RMP would incorporate existing recovery plans, management strategies, and guidelines for federally listed threatened and endangered (T&E) species. State management plans would be considered for delisted species.
- The RMP will recognize the State of South Dakota's authority on its water law and water rights.
- The BLM and Forest Service will consider allocative and prescriptive standards to conserve GRSG habitat, as well as objectives and management actions to restore, enhance, and improve its habitat.
- The BLM and Forest Service will use a collaborative and multi-jurisdictional approach, where appropriate, to determine the desired future condition of public lands and National Forest System lands for the conservation of GRSG and their habitats.
- The BLM will use SDGFP GRSG data and expertise to the fullest extent practicable in making management determinations on federal lands.

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CHAPTER 2

APPROVED RESOURCE MANAGEMENT PLAN FOR GREATER SAGE-GROUSE HABITAT

2.1 DESCRIPTION OF GRSG HABITAT MANAGEMENT AREAS

The decision area for GRSG habitat management within this RMP includes BLM-administered lands in GRSG habitat management areas, including surface lands and split-estate with BLM subsurface mineral rights. GRSG habitat on BLM-administered lands in the decision area consists of lands allocated as priority habitat management areas (PHMA) and general habitat management areas (GHMA). Refer to **Figure 2-1** and **Tables 2-1** and **2-2**.

Table 2-1
Acres of PHMA and GHMA in the Decision Area for the ARMP

Surface Land Management	PHMA	GHMA
BLM-administered surface estate	127,735	23,684
BLM-administered mineral estate	412,822	247,771

Source: BLM GIS 2015

Table 2-2
Acres of GRSG Habitat by County in the Decision Area BLM
Surface and Mineral Estate

County Name¹	ARMP		
	PHMA	GHMA	Total
Butte	111,392	11,502	122,894
Harding	16,343	12,182	28,525
Total	127,735	23,684	151,419

Source: BLM GIS 2015

¹None of the other counties in the planning area contain mapped GRSG habitat.

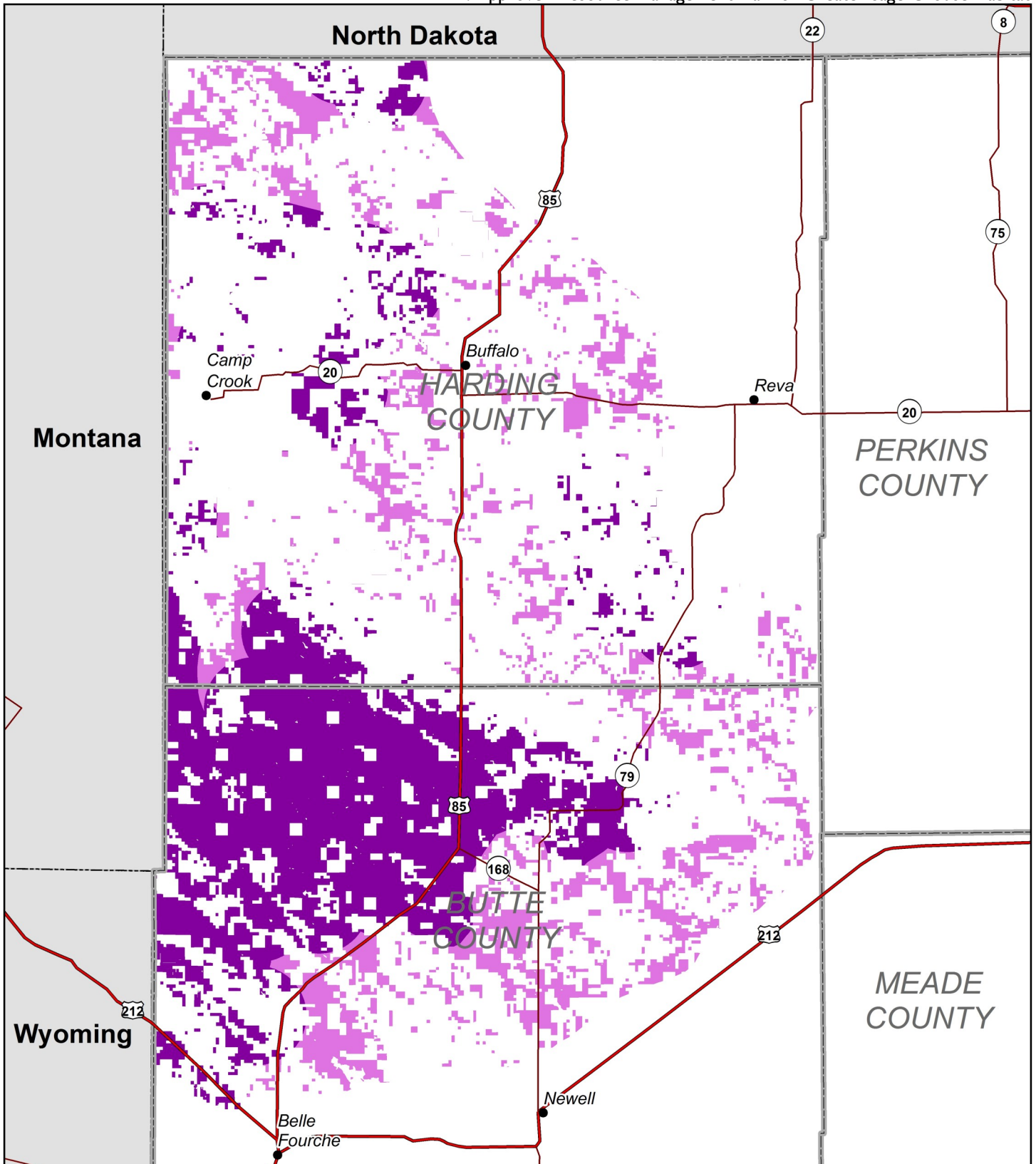
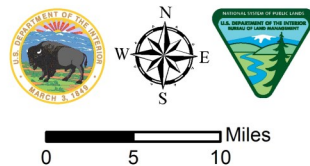


Figure 2-1: South Dakota Habitat Management Areas

- Priority Habitat Management Areas (PHMAs)
- General Habitat Management Areas (GHMAs)
- Planning Area Boundary
- State Boundary



September 2015



No warranty is made by the Bureau of Land Management (BLM). The accuracy, reliability, or completeness of these data for individual use or aggregate use with other data is not guaranteed.

PHMA and GHMA are defined as follows:

- PHMA—BLM-administered lands identified as having the highest value to maintaining sustainable GRSG populations. The boundaries and management strategies for PHMA are consistent with the GRSG core habitat areas that were established by SDGFP in December 2014.
- GHMA—BLM-administered lands where some special management would apply to sustain GRSG populations. The boundaries and management strategies for GHMA are derived from and generally follow the preliminary general habitat boundaries identified in the Proposed RMP/Final EIS.

There are no proposed SFA in the South Dakota planning area, as GRSG densities are lower and quality habitat is limited compared to other western states that have SFA. Other important habitat areas, such as winter range, brood-rearing, and nesting areas, are addressed throughout the range of alternatives. The biologically significant unit (BSU) for this plan is delineated as the “Dakotas population” in the COT report (USFWS 2013). **Figure 2-2** in **Appendix A1** is a map of the PHMA within the BSU.

2.2 SOUTH DAKOTA GRSG CONSERVATION SUMMARY

The ARMP identifies and incorporates conservation measures to protect, enhance, and restore GRSG habitat by avoiding, minimizing, and compensating for unavoidable impacts of threats to GRSG habitat. The ARMP addresses threats to GRSG and its habitat identified by the USFWS in the March 2010 listing decision, as well as those threats described in the USFWS’s COT report. In the report, the USFWS identified threats by GRSG population across the range and stated whether that threat is present and widespread, present but localized, or unknown for that specific population.

Tables 2-3 and **2-4** identify the threats to GRSG in the planning area. **Table 2-4** further describes the key components of the ARMP that address these threats.

Table 2-3
Threats to GRSG in the South Dakota Planning Area as Identified by the
Conservation Objectives Team

GRSG Identified Populations from the COT Report Applicable to the South Dakota Planning Area	Unit Number	Isolated Small Size	Sagebrush Elimination	Agriculture Conversion	Fire	Conifers	Weeds/Annual Grasses	Energy	Mining	Infrastructure	Improper Grazing	Free-Roaming Equids	Recreation	Urbanization
Dakotas (North Dakota, South Dakota)	I	Y	L	L	Y	U	L	Y	Y	Y	L	N	N	N

Source: USFWS 2013

Threats are characterized as Y = threat is present and widespread, L = threat present but localized, and U = unknown.

Table 2-4
Key Components of the South Dakota ARMP Addressing the COT Report Threats

Threats to GRSG and its Habitat (from COT Report)	Key Component of the South Dakota ARMP
All threats	<ul style="list-style-type: none"> • Implement the adaptive management plan, which allows for more restrictive land use allocations and management actions to be implemented if habitat or population hard triggers are met. • Require and ensure mitigation that provides a net conservation gain to GRSG. • Monitor implementation and effectiveness of conservation measures in GRSG habitats according to the habitat assessment framework (HAF).
All development threats, including mining, infrastructure, and energy development	<ul style="list-style-type: none"> • PHMA—Implement a human disturbance cap of 3% at the BSU and project area scale. • PHMA—Implement a density cap of an average of 1 energy and mining facility per 640 acres. • GHMA—Limit surface-disturbing and disruptive activities 0.6 mile from leks and in winter range in GHMA. • Apply buffers based on project type and location to address impacts on leks when authorizing actions in GRSG habitat. • Apply required design features (RDFs) when authorizing actions in GRSG habitat. • Minimize the effects of infrastructure projects, including siting, using the best available science, updated as monitoring information on current infrastructure projects becomes available.
Energy development—fluid minerals	<ul style="list-style-type: none"> • PHMA—Open to fluid mineral leasing subject to no surface occupancy (NSO) stipulation without waiver or modification, and with limited exception. • GHMA—Open to fluid mineral leasing subject to NSO stipulation within 0.6 mile of an occupied lek; open with controlled surface use (CSU) stipulation within two miles of leks. Winter range in GHMA would be open subject to NSO stipulation. • Prioritize the leasing and development of fluid mineral resources outside GRSG habitat.
Energy development—wind energy	<ul style="list-style-type: none"> • PHMA—Exclusion area for wind energy (not available for wind energy development under any conditions). • GHMA—Exclusion area within one mile of leks. Other portions of GHMA would be an avoidance area. Exclusion areas one mile from leks and avoidance in other parts of GHMA. Winter range in GHMA would be exclusion areas.
Energy development—solar energy	<ul style="list-style-type: none"> • PHMA—Exclusion area (not available for solar energy development under any conditions). • GHMA—Exclusion area (not available for solar energy development under any conditions).
Infrastructure—major ROWs	<ul style="list-style-type: none"> • PHMA—Avoidance area (may be available for major ROW development with special stipulations). • GHMA—Avoidance area (may be available for major ROWs with special stipulations).

Table 2-4
Key Components of the South Dakota ARMP Addressing the COT Report Threats

Threats to GRSG and its Habitat (from COT Report)	Key Component of the South Dakota ARMP
Infrastructure—minor ROWs	<ul style="list-style-type: none"> • PHMA—Avoidance area (may be available for minor ROW development with special conditions). • GHMA—Avoidance within two miles of leks. Winter range would be avoidance areas (may be available for minor ROWs with special stipulations).
Mining—locatable minerals	<ul style="list-style-type: none"> • Apply RDFs to locatable minerals consistent with applicable law.
Mining—salable minerals	<ul style="list-style-type: none"> • PHMA—Closed area (not available for salable minerals) with a limited exception (may remain open to free use permits and expansion of existing active pits if criteria are met).
Mining—coal	<ul style="list-style-type: none"> • PHMA is essential habitat for GRSG for purposes of the suitability criteria set forth at 43 CFR, Part 3461.5(o)(1).
Improper livestock grazing	<ul style="list-style-type: none"> • Prioritize the review and processing of grazing permits and leases in PHMA. • Include in the NEPA analysis for renewals and modifications of grazing permits and leases specific management thresholds, based on the GRSG habitat objectives table, land health standards, and ecological site potential, to allow adjustments to grazing that have already been subjected to NEPA analysis. • Prioritize field checks in PHMA to ensure compliance with the terms and conditions of grazing permits.
Free-roaming equid (wild horses and burros) management	<ul style="list-style-type: none"> • Not applicable; none in the planning area.
Range management structures	<ul style="list-style-type: none"> • Allow range improvements that do not impact GRSG or that provide a conservation benefit to GRSG, such as fences for protecting important seasonal habitats.
Recreation	<ul style="list-style-type: none"> • PHMA—Do not construct new recreation facilities. • Deny special recreation permits (SRP) that would adversely impact GRSG or its habitat.
Fire	<ul style="list-style-type: none"> • PHMA—Prioritize aggressive suppression techniques immediately after life and property to conserve the habitat. • GHMA—Within 3 miles of leks, prioritize aggressive suppression techniques immediately after life and property to conserve the habitat.
Nonnative, invasive plants species	<ul style="list-style-type: none"> • Treat sites in PHMA and GHMA that contain invasive species infestations through an integrated pest management (IPM) approach.
Sagebrush removal	<ul style="list-style-type: none"> • PHMA—Maintain all lands ecologically capable of producing sagebrush (but no less than 70%) with a minimum of 15% sagebrush canopy cover or as consistent with specific ecological site conditions. • Ensure that all BLM use authorizations contain terms and conditions regarding the actions needed to meet or progress toward meeting the habitat objectives for GRSG. Limits surface-disturbing activities in PHMA.

Table 2-4
Key Components of the South Dakota ARMP Addressing the COT Report Threats

Threats to GRSG and its Habitat (from COT Report)	Key Component of the South Dakota ARMP
Pinyon and juniper expansion	<ul style="list-style-type: none"> Not applicable; none in the planning area.
Agricultural conversion and exurban development	<ul style="list-style-type: none"> Retain GRSG habitat in federal management.

The ARMP also identifies conservation measures that are designed to protect, enhance, and restore GRSG habitat. The ARMP applies the following summarized management decisions, subject to valid existing rights, to other uses and resources:

- Providing a framework for prioritizing areas in PHMA and GHMA for wildfire, invasive annual grass, and conifer treatments
- Requiring specific design features for certain types of lands and realty uses
- Implementing the disturbance management protocol to limit disturbance in PHMA
- Including GRSG habitat objectives in land health standards
- Adjusting grazing practices as necessary, based on GRSG habitat objectives, land health standards, and ecological site potential
- Applying NSO stipulations, with limited exceptions, to fluid mineral development in PHMA and closing PHMA to nonenergy leasable development and mineral material sales

The ARMP also establishes screening criteria and conditions for new human activities in PHMA and GHMA to ensure a net conservation gain to GRSG. The ARMP will reduce habitat disturbance and fragmentation by limiting surface-disturbing activities, while addressing changes in resource conditions and use through monitoring and adaptive management.

2.3 GOALS, OBJECTIVES, AND MANAGEMENT DECISIONS FOR GRSG HABITAT

This section of the ARMP presents the goals, objectives, land use allocations, and management decisions established for protecting and preserving Greater Sage-grouse and its habitat on public lands managed by the BLM in South Dakota. Throughout the planning area, BLM-authorized activities associated with all resources and all resource use programs will be subject to impact mitigation guidelines and BMPs in **Appendix J** and RDFs in **Appendix C**. A *Monitoring Framework* is also included in **Appendix D** to describe how the implemented program decisions will be monitored.

Many of these goals, objectives, and management decisions identified in this section can also be found in Section 3.0 of this RMP for other resources and/or program areas (e.g., Physical Resources) and have been consolidated in this section to depict how the agency will manage GRSG habitat.

Goals specific to GRSG and other Special Status Species include:

- Ensure the long-term and self-sustaining persistence of special status species in South Dakota.
- Protect/maintain populations of special status species by minimizing direct mortality and impacts on habitat.
- Provide suitable habitat condition to allow for movement between large blocks of habitat and seasonal and specialized habitats on a local and landscape scale.
- Maintain or improve specialized habitats on a local and landscape scale.
- Maintain and/or increase GRSG abundance and distribution by conserving, enhancing or restoring the sagebrush ecosystem upon which populations depend in cooperation with other conservation partners.
- Within GRSG habitat areas, the BLM will maintain habitat for viable GRSG populations.
- Manage for the biological integrity and habitat suitability to facilitate the conservation, recovery, and maintenance of populations of fish and wildlife to avoid contributing to the listing of or jeopardizing the continued existence or recovery of special status species and their habitats.
- Maintain or enhance areas of ecological importance for special status wildlife species.
- Conserve and recover special status wildlife species by determining and implementing conservation strategies including restoration opportunities, use restrictions, and management decisions.
- Manage specific environmental hazards, risks, and impacts in a manner compatible with special status wildlife species health.
- Identify habitat thresholds necessary to sustain well-distributed healthy populations of special status wildlife species to avoid future listings under the ESA.
- Develop and implement the BMPs, activity plans, or use other mechanisms to protect high priority special status wildlife species.
- Manage special status fish and wildlife species in consideration of the working landscape and the intermingled land ownership pattern that is present.
- Across the planning area, maintain greater sagebrush cover at levels at or near the full potential for the each ecological site.
- Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside of PHMA and GHMA.
- In all PHMA, the desired condition is to maintain all lands ecologically capable of producing sagebrush (but no less than 70%) with a minimum of 15% sagebrush canopy cover or as consistent with specific ecological site conditions. The attributes necessary to sustain these habitats are described in Interpreting Indicators of Rangeland Health (BLM Tech Ref 1734-6).
- Manage wildfire and fuels for the protection of public health, safety, property, and resource values, emphasizing firefighter and public safety as the single overriding priority. The protection of human life is the single, overriding priority. Setting priorities among protecting

human communities and community infrastructure, other property and improvements, and natural and cultural resources will be done based on the values to be protected, human health and safety, and the costs of protection.

- Improve the resilience of wildlife habitats to protect wildlife communities from stressors and events such as severe wildfire and climate change.
- Manage PHMA so that discrete anthropogenic (human-caused) disturbances do not adversely impact GRSG distribution or abundance.

Table 2-5 is a summary of the allocation decisions presented for each GRSG habitat management area.

Table 2-5
Summary of Allocation Decisions by GRSG Habitat Management Areas

Resource	PHMA	GHMA
Land Tenure	Retain	Retain
Solar	Exclusion	Avoidance
Wind	Exclusion	Avoidance
Major ROWs	Avoidance	Avoidance
Minor ROWs	Avoidance	Open
Oil and Gas	Open with Major Stipulations	Open with Minor Stipulations
Geothermal	Open with Major Stipulations	Open with Minor Stipulations
Non-energy Leasables	Closed	Open
Salable Minerals	Closed except for free use permits	Open
Locatable Minerals	Open	Open
Travel Management	Limited	Limited
Livestock Grazing	Open	Open

2.3.1 Management Decisions for Greater Sage-Grouse General Habitat Management Areas

MD-10 Greater Sage-Grouse GHMA: includes 23,684 surface and 247,771 subsurface oil and gas minerals acres.

MD-11 Surface Disturbing and Disruptive Activities and Fluid Minerals: Surface disturbing and disruptive activities will be avoided within 6/10 of a mile of sage-grouse leks. BLM will apply the lek buffer-distances in the US Geological Survey (USGS) Report “Conservation Buffer Distance Estimates for Greater Sage-Grouse-A Review (Open File Report 2014-1239)” in both GHMA and PHMA as detailed in **Appendix B**, Applying Lek Buffer-Distances When Approving Actions.

Fluid Minerals - NSO: NSO or use within 6/10 of a mile from leks. The Authorized Officer (AO) may waive this stipulation if no portion of the leasehold is within 6/10 mile of the perimeter of an active lek.

MD-12 Renewable Energy ROWs: Renewable Energy ROWs: 1 mile from leks will be an exclusion area, the rest of the GHMA will be an avoidance area.

Other types of ROWs: Major ROWs (power lines 100 kilovolt (kV) and pipelines 24 inches and over) will be avoided. Minor ROWs within 2 miles of a lek will be avoidance, the rest of the GHMA will be open.

Where new ROWs are necessary, ROWs will be co-located within existing ROWs where possible.

GHMA and PHMA within the Center of the Nation will be Class 2 land retention areas (**Appendix A1**: Figure 2-10).

MD-13 Land Disposals: Any land disposals will be limited and subject to specialist review. Refer to the Land Tenure subsection of the Lands section of this table for additional details about Class 2 retention criteria.

BLM could also dispose of land in PHMA and GHMA within the Center of the Nation areas in cases where there is mixed ownership, and land exchanges will allow for additional or more contiguous federal ownership patterns and the criteria below are met.

Under GRSG habitat areas with minority federal ownership, BLM will develop an additional, effective mitigation agreement for any disposal of federal land. As a final preservation measure, consideration will be given to pursuing a permanent conservation easement. Lands classified as PHMA and GHMA for GRSG will be retained in federal management unless: (1) the agency can demonstrate that disposal of the lands, including land exchanges, will provide a net conservation gain to the GRSG or (2) the agency can demonstrate that the disposal, including land exchanges, of the lands will have no direct or indirect adverse impact on conservation of the GRSG.

MD-14 Surface Disturbing and Disruptive Activities and Fluid Minerals: Surface disturbing and disruptive activities will be avoided in winter range for sage-grouse unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated, Conservation Actions, Guidelines or needed design features (Appendices C and F) are included and the goals for sage-grouse are not compromised. Prior to approving any surface disturbance and disruptive activities, the project proponent will be required to provide a plan approved by BLM to maintain suitability of habitat and avoid or minimize habitat loss and disturbance.

Fluid Minerals - NSO: GRSG crucial winter range will be managed as a NSO for oil and gas development and exploration.

MD-15 Renewable Energy/Winter Range: GRSG winter range will be an exclusion area.

Within GHMA, major ROWs are avoidance and minor ROWs are avoidance within two miles of leks with GHMA. The rest of the GHMA is open to minor ROWs. GRSG winter range will be an avoidance area. In cases where avoidance is not possible, BLM may require design features to mitigate impacts or co-location of new ROWs with existing ROWs where possible.

MD-16 Surface Disturbing and Disruptive Activities and Fluid Minerals: Fluid Minerals - A CSU stipulation will apply within 2 miles of leks. The AO may waive this stipulation if no portion of the leasehold is within 2 miles of the perimeter of an active lek.

Fluid Minerals: A CSU stipulation will apply within 2 miles of leks. The AO may waive this stipulation if no portion of the leasehold is within 2 miles of the perimeter of an active lek.

MD-17 Greater Sage-Grouse GHMA: Same as MD-12.

MD-18 Utility and Power lines: All new utility and power lines (overhead lines) that can be safely buried will be buried within 2 miles of GRSg leks and within GRSg winter range.

When burial of power lines is not possible, above ground lines will be located and designed to minimize impacts of predation, collision and other associated stressors to GRSg.

Existing overhead lines within 2 miles of leks and within GRSg winter range will be evaluated for threats to GRSg and if necessary, modified to reduce the threat. If modification is not likely to be effective, the overhead line may be relocated. Any requirements for modification or relocation of existing overhead lines will be subject to valid existing rights.

Oil and Gas (O&G) - CSU: All new utility and power lines that can be safely buried will be buried within 2 miles of sage-grouse leks and within sage-grouse winter range.

When burial of power lines is not possible, above ground lines will be located and designed to minimize impacts of predation, collision and other associated stressors to sage-grouse.

Existing overhead lines within 2 miles of leks and within sage-grouse winter range will be evaluated for threats to sage-grouse and if necessary, modified to reduce the threat. If modification will not likely be effective, the overhead line may be relocated. Any requirements for modification or relocation of existing overhead lines will be subject to valid existing rights.

MD-19 Weed Treatments: Timing Limit (TL): Herbicide treatments limited to spot weed treatments only within a 3 mile buffer zone, of known sage-grouse leks from March 1-June 30. Exceptions to treatment types and dates of treatments may be allowed to address aggressively spreading weeds or invasive plants that require aggressive and timely treatment during this period following consultation with necessary specialists to minimize impacts on sage-grouse.

MD-20 Temporary Travel Closures: Temporary travel closures will be considered in accordance with 43 CFR subpart 8364 (Closures and Restrictions); 43 CFR subpart 8351 (Designated National Area); 43 CFR subpart 6302 (Use of Wilderness Areas, Prohibited Acts, and Penalties); and 43 CFR subpart 8341 (Conditions of Use). Temporary closure or restriction orders under these authorities are enacted at the discretion of the AO to resolve management conflicts and protect persons, property, and public lands and resources.

Where an AO determines that off-highway vehicles (OHV) are causing or will cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitat, cultural resources, historical resources, threatened or endangered species, wilderness suitability, other authorized uses, or other resources, the affected areas shall be immediately closed to the type(s) of vehicle causing the adverse effect until the adverse effects are eliminated and measures are implemented to prevent recurrence (43 CFR, Part 8341.2).

A closure or restriction order will be considered only after other management strategies and alternatives have been explored. The duration of temporary closure or restriction orders will be limited to 24 months or less; however, certain situations may require longer closures and/or iterative temporary closures. This may include closure of routes or areas.

2.3.2 Management Decisions for Greater Sage-Grouse Priority Habitat Management Areas

*MD 1-10 address other Special Status Species. Refer to Special Status Species in **Section 3**.*

MD-20 Greater Sage-Grouse PHMA: Manage PHMA so that discrete anthropogenic (human-caused) disturbances do not adversely impact GRSG distribution or abundance.

MD-21 Greater Sage-Grouse PHMA: PHMA will be the same as the State of South Dakota Sage-grouse Core Areas (SDGFP 2014); which includes 127,735 surface and 412,822 subsurface oil and gas minerals acres. See Figure 1-2 and 1-3. Adaptive management for sage-grouse is described in Chapter 2 Narrative section under Greater Sage-Grouse. BLM will apply the lek buffer-distances in the USGS Report “Conservation Buffer Distance Estimates for Greater Sage-Grouse-A Review (Open File Report 2014-1239)” in both GHMA and PHMA as detailed in **Appendix B**, Applying Lek Buffer-Distances When Approving Actions.

MD-22 Surface Disturbing and Disruptive Activities and Fluid Minerals: Surface disturbing and disruptive activities may be allowed if the project proponent can clearly demonstrate that adverse impacts on sage-grouse can be adequately mitigated through BMPs, guidelines (**Appendix J**), disturbance is within the 3% disturbance cap limit (**Appendix E**) and RDFs (**Appendix C**) are included and the goals for sage-grouse not compromised. If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) within GRSG PHMA in any given BSU, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 hard rock mining law, valid existing rights, etc.) will be permitted by BLM within PHMA in any given BSU until the disturbance has been reduced to less than the cap.

If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) or if anthropogenic disturbance and habitat loss associated with conversion to agricultural tillage or fire exceed 5% within a project analysis area in PHMA, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.) will be permitted by BLM within PHMA in a project analysis area until the disturbance has been reduced to less than the cap. Within existing designated utility corridors, the 3% disturbance cap may be exceeded at the project scale if the site specific NEPA analysis indicates that a net conservation gain to the species will be achieved. This exception is limited to projects which fulfill the use for which the corridors were designated (ex., transmission lines, pipelines) and the designated width of a corridor will not be exceeded as a result of any project co-location.

Subject to applicable laws and regulations and valid existing rights, if the average density of one energy and mining facility per 640 acres (the density cap) is exceeded on all lands (regardless of land ownership) in PHMA within a proposed project analysis area, then no further disturbance from energy or mining facilities will be permitted by BLM: (1) until disturbance in the proposed project analysis area has been reduced to maintain the limit under the cap; or (2) unless the energy or mining facility is co-located into

an existing disturbed area. This direction applies to the following: oil and gas wells and development facilities, coal mines, wind towers, solar fields, geothermal, and mining (active locatable, leasable, and saleable developments). **Appendix E** provides specific details about how calculations are determined for disturbance caps. Prior to approving any surface disturbance and disruptive activities, the project proponent will be required to provide a plan approved by BLM to maintain suitability of habitat and avoid or minimize habitat loss and disturbance.

Fluid Minerals - NSO: PHMA will be managed as NSO and Use (127,735 surface and 412,822 oil and gas subsurface minerals acres). These areas will be open to oil and gas leasing with a NSO stipulation. All sage-grouse habitat that is not part of PHMA will be managed as GHMA as noted in Figure 1-2.

Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside of PHMA and GHMA.

Waivers or modifications to a fluid minerals lease NSO stipulation will not be granted. The AO may grant an exception to a fluid mineral lease NSO stipulation in certain cases. Exceptions based on conservation gain (ii) may only be considered in (A) PHMA of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) area of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMP. See **Appendix G**.

Oil and gas stipulations will also apply to geothermal resources. Locatable minerals will be open. RDFs (**Appendix C**) and other applicable BMPs and Guidelines (**Appendix J**) will be applied as BMPs or Guidelines for locatable minerals, subject to valid existing rights and the mining laws. Non-energy leasable minerals and salable minerals will be closed except for the following exception:

PHMA are closed to new mineral material sales. However, these areas remain “open” to free use permits and the expansion of existing active pits, only if the following criteria are met:

The activity is within the BSU and project area disturbance cap; the activity is subject to the provisions set forth in the mitigation measures (**Appendix F**) BMPs and Guidelines (**Appendix J**), and RDFs for Greater Sage-Grouse Habitat (**Appendix C**) are applied, and the activity is permissible under the subregional screening criteria.

Required Design Features: RDFs are required for certain activities in all GRSG habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project or activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project or activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.

- An alternative RDF, a state-implemented conservation measure or plan-level protection is determined to provide equal or better protection for GRSG or its habitat.
- A specific RDF would provide no additional protection to GRSG or its habitat.

Where the federal government owns the mineral estate in PHMA and GHMA, and the surface is in non-federal ownership, the federal government will apply the same stipulations, Conditions of Approval (COAs), and/or conservation measures and mineral RDFs if the mineral estate is developed on BLM-administered lands in that management area, to the maximum extent permissible under existing authorities, and in coordination with the landowner.

Where the federal government owns the surface and the mineral estate is in non-federal ownership in PHMA and GHMA, the federal government will apply appropriate surface use COAs, stipulations, and mineral RDFs through ROW grants or other surface management instruments, to the maximum extent permissible under existing authorities, in coordination with the mineral estate owner/lessee.

At the time an application for a new coal lease or lease modification is submitted to the BLM, the BLM will determine whether the lease application area is “unsuitable” for all or certain coal mining methods pursuant to 43 CFR, Part 3461.5. PHMA is essential habitat for maintaining GRSG for purposes of the suitability criteria set forth at 43 CFR, Part 3461.5(o)(1).

MD-23 Grazing Permits and Leases: At the time a permittee or lessee voluntarily relinquishes a permit or lease, the BLM will consider whether the public lands where that permitted use was authorized should remain available for livestock grazing or be used for other resource management objectives, such as reserve common allotments (RCA) or fire breaks. This does not apply to or impact grazing preference transfers, which are addressed in 43 CFR, Part 4110.2-3.

MD-24 Other Resources Uses: Other resource uses within PHMA may be allowed pending project level environmental review provided that Mitigation, BMPs Guidelines, standard operating procedures (SOP), and RDFs are implemented, Impacts are evaluated as described in the GRSG Effects Analysis Process (**Appendix I**) and the project does not exceed the disturbance cap (**Appendix E**) and the goals for sage-grouse and sage-grouse habitat are not compromised. Categorical Exclusions (CXs) including those under the Energy Policy Act of 2005, Section 390 will not be used in priority sage-grouse habitats due to resource conflicts.

MD-25 Renewable Energy ROWs: PHMA will be exclusion areas. Other types of ROWs: PHMA will be avoidance areas. Winter range is an exclusion areas for renewable energy ROWs.

MD-26 General ROWs: PHMA are defined as avoidance areas for all General ROWs (major and minor). Renewable ROWs are addressed in MD-25 above. Sage-Grouse winter range is treated the same in PHMA and GHMA: These areas are avoidance areas for general ROWs.

If a proposed project cannot be avoided, the following actions will apply:

Within PHMA all new power and utility lines (overhead lines) that can be safely buried will be buried.

When burial of power lines is not possible, above ground lines will be located and designed to minimize impacts of predation, collision and other associated stressors to sage-grouse.

Existing overhead lines within PHMA and within sage-grouse winter range will be evaluated for threats to sage-grouse and if necessary, modified to reduce the threat. If modification is not likely to be effective, the overhead line may be relocated.

Any requirements for modification or relocation of existing overhead lines will be subject to valid existing rights.

Consider the likelihood of development of not-yet-constructed surface-disturbing activities – as defined in Table 2 of the Monitoring Framework (**Appendix D**)—under valid existing rights prior to authorizing new projects in PHMA.

MD-27 Lands and Realty: PHMA and GHMA within the Center of the Nation will be Class 2 land retention areas (**Appendix A2**, Map E and Figure I-3). Any land disposals will be limited and subject to specialist review. Refer to the Land Tenure subsection of the Lands section of this table for additional details about Class 2 retention criteria.

BLM could also dispose of land in PHMA and GHMA within the Center of the Nation areas in cases where there is mixed ownership, and land exchanges will allow for additional or more contiguous federal ownership patterns.

Under sage-grouse habitat areas with minority federal ownership, BLM will develop an additional, effective mitigation agreement for any disposal of federal land. As a final preservation measure, consideration will be given to pursuing a permanent conservation easement. Lands classified as PHMA and GHMA for GRSG will be retained in federal management unless: (1) the agency can demonstrate that disposal of the lands, including land exchanges, will provide a net conservation gain to the GRSG or (2) the agency can demonstrate that the disposal, including land exchanges, of the lands will have no direct or indirect adverse impact on conservation of the GRSG.

The agency can demonstrate that disposal of the lands will provide a net conservation gain to Greater Sage-Grouse; or the agency can demonstrate that the disposal of the lands will have no direct or indirect adverse impact on conservation of Greater Sage-Grouse.

MD-28 Weed Treatments: TL: Spot weed treatments only, using IPM methods within all suitable nesting or brood rearing habitat of known sage-grouse leks from March 1-June 30.

MD-29 Surface Disturbance and Disruptive Activities and Fluid Minerals in Winter Range: Winter range in PHMA will be treated the same as winter range in GHMA: Surface disturbing and disruptive activities will not be allowed in winter range for sage-grouse unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated, conservation actions or needed design features are included and the goals of this plan are not compromised. Prior to approving any surface disturbance and disruptive activities, the project proponent will be required to provide a plan approved by BLM to maintain suitability of habitat and avoid or minimize habitat loss and disturbance.

Fluid Minerals - NSO: Sage-grouse winter range will be managed as a NSO for oil and gas development and exploration. Waivers or modifications to a fluid minerals lease no-surface-occupancy stipulation will not be granted for NSO stipulations in PHMA.

MD-30 Rights of Ways (ROWs): Winter range in PHMA will be treated the same as winter range in GHMA: Renewable Energy ROWs in sage-grouse winter range will be an exclusion area.

Other types of ROWs in sage-grouse winter range will be an avoidance area. In cases where avoidance is not possible, BLM may require co-location of new ROWs with existing ROWs where possible.

ROWs are defined for sage-grouse management in terms of major and minor ROWs. Major ROWs include transmission lines 100kV and greater and pipelines 24 inches in width and greater. Minor ROWs include utilities under these design descriptions, as well as communication sites and towers.

Greater Sage-Grouse PHMA are avoidance areas for major and minor ROWs.

Within GHMA, major ROWs are avoidance and minor ROWs are avoidance within two miles of leks with GHMA. The rest of the GHMA is open to minor ROWs.

Sage-Grouse winter range is treated the same in PHMA and GHMA: These areas are avoidance areas for general ROWs and exclusion areas for renewable energy ROWs.

MD-31 Seasonal Habitat Objectives: Seasonal habitat objectives identified in Table 2-5 will be incorporated into all project designs, as appropriate, based on site conditions and ecological potential.

Habitat objectives include metrics for sagebrush height, cover, and other vegetation characteristics typical of sage-grouse habitat at the eastern edge of the species' distribution.

MD-32 Land Health Standards: BLM will prioritize grazing leases in PHMA to determine if modifications are necessary prior to renewals or if the allotment does not meet Land Health Standards.

MD-33 Prescribed Fire: Prescribed fire may be allowed in PHMA and general habitat if it is done solely for the purposes of improving or maintaining sage-grouse habitat. If prescribed fire is used in Greater Sage-Grouse habitat, the NEPA analysis for the Burn Plan will address the following:

- Why alternative techniques were not selected as a viable options;
- How Greater Sage-Grouse goals and objectives would be met by its use;
- How the COT report objectives would be addressed and met;
- Develop a risk assessment to address how potential threats to Greater Sage-Grouse habitat would be minimized.

Prescribed fire as a vegetation or fuels treatment shall only be considered after the NEPA analysis for the Burn Plan has addressed the four bullets outlined above. Prescribed fire could be used to meet specific fuels objectives that would protect Greater Sage-Grouse habitat in PHMA (e.g., creation of fuel breaks that would disrupt the fuel continuity across the landscape in stands where annual invasive grasses are a minor component in the understory, and burning slash piles from conifer reduction treatments, used as a component with other treatment methods to combat annual grasses and restore native plant communities).

Prescribed fire in known winter range shall only be considered after the NEPA analysis for the Burn Plan has addressed the four bullets outlined above. Any prescribed fire in winter habitat would be designed to strategically reduce wildfire risk around and/or in the winter range and designed to protect winter range habitat quality. Secretarial order SO3336 will be applied to protect GRSG habitat from fire: <http://www.forestsandrangelands.gov/rangeland/index.shtml>.

MD-34 Grazing Permits/Leases: The NEPA analysis for renewals and modifications of livestock grazing permits/leases within PHMA will include specific management thresholds based on GRSG Habitat Objectives Table and Land Health Standards (43 CFR, Part 4180.2) and ecological site potential and one or more defined responses that will allow the authorizing officer to make adjustments to livestock grazing that have already been subjected to NEPA analysis.

MD 35 – Grazing Allotments: Allotments within PHMA, focusing on those containing riparian areas, including wet meadows, will be prioritized for field checks to help ensure compliance with the terms and conditions of the grazing permits. Field checks could include monitoring for actual use, utilization, and use supervision.

MD 36 – Review and prioritization of Grazing Leases/Permits: The BLM will prioritize (1) the review of grazing permits/leases, in particular to determine if modification is necessary prior to renewal, and (2) the processing of grazing permits/leases in PHMA. In setting workload priorities, precedence will be given to existing permits/leases in these areas not meeting Land Health Standards, with focus on those containing riparian areas, including wet meadows. The BLM may use other criteria for prioritization to respond to urgent natural resource concerns (ex., fire) and legal obligations.

MD-37: Range Improvements: Range improvements in PHMA would be allowed if the improvements would not impact GRSG, improvements would provide a conservation benefit to GRSG such as fences for protecting important seasonal habitats, or if improvements would meet the lek buffer requirement. Refer to **Appendix B** for a discussion about GRSG lek buffers.

MD-38 Recreation: In PHMA, BLM will not construct new recreation facilities (e.g., campgrounds, trails, trailheads, staging areas) unless the development would have a net conservation gain to GRSG habitat (such as concentrating recreation, diverting use away from critical areas, etc.), or unless the development is required for visitor health and safety or resource protection.

MD-39: Travel: Temporary travel closures will be considered in accordance with 43 CFR subpart 8364 (Closures and Restrictions); 43 CFR subpart 8351 (Designated National Area); 43 CFR subpart 6302 (Use of Wilderness Areas, Prohibited Acts, and Penalties); and 43 CFR subpart 8341 (Conditions of Use). Temporary closure or restriction orders under these authorities are enacted at the discretion of the AO to resolve management conflicts and protect persons, property, and public lands and resources.

Where an AO determines that OHVs are causing or will cause considerable adverse effects upon soil, vegetation, wildlife, wildlife habitat, cultural resources, historical resources, threatened or endangered species, wilderness suitability, other authorized uses, or other resources, the affected areas shall be immediately closed to the type(s) of vehicle causing the adverse effect until the adverse effects are eliminated and measures are implemented to prevent recurrence (43 CFR, Part 8341.2).

A closure or restriction order will be considered only after other management strategies and alternatives have been explored. The duration of temporary closure or restriction orders will be limited to 24 months or less; however, certain situations may require longer closures and/or iterative temporary closures. This may include closure of routes or areas.

Habitat Objectives

BLM will incorporate Greater Sage-Grouse Seasonal Habitat Objectives (see Table 2-5) into the design of projects or activities, as appropriate, based on site conditions and ecological potential, unless achievement of fuels management objectives require additional reduction in sagebrush cover to meet strategic protection of sage-grouse habitat and conserve habitat quality for the species, unless at least one of the following conditions can be demonstrated and documented in the NEPA analysis associated with the specific project:

- (i) A specific objective is not applicable to the site-specific conditions of the project or activity;
- (ii) An alternative objective is determined to provide equal or better protection for sage-grouse or its habitat (based on appropriate scientific findings); or
- (iii) Analysis concludes that following a specific objective would provide no more protection to sage-grouse or its habitat than not following it, for the project being proposed.

In all PHMA, the desired condition is to maintain all lands ecologically capable of producing sagebrush (but no less than 70%) with a minimum of 15% sagebrush canopy cover or as consistent with specific ecological site conditions. The attributes necessary to sustain these habitats are described in Interpreting Indicators of Rangeland Health (BLM Tech Ref 1734-6).

These habitat objectives in Table 2-5 summarize the characteristics that research has found represent the seasonal habitat needs for Greater Sage-Grouse. The specific seasonal components identified in the Table were adjusted based on local science and monitoring data to define the range of characteristics used in this subregion. Thus, the habitat objectives provide the broad vegetative conditions BLM strives to obtain across the landscape that indicate the seasonal habitats used by sage-grouse. These habitat indicators are consistent with the rangeland health indicators used by the BLM.

The sage-grouse habitat characteristics will be used as one of several tools for assessing habitats and guiding management actions. Site suitability is determined by the relationship among the several indicator values in each matrix and the relative abundance of habitat types across the landscape. It is important to understand that the desired conditions described for these habitat types are based on average plant productivity, structural data, and expert opinion relative to sage-grouse use of a subset of sagebrush communities, and they may not apply to all sagebrush communities in the planning area variation (Davies et al. 2006). These measures also do not account for inter-annual climate variation (Davies et al. 2006). Individual indicator values do not define site suitability and overall site suitability descriptions require an interpretation of the relationships between the indicators and other factors. Measurement of these objectives will follow the steps described in **Appendix D**.

The habitat objectives will be part of the sage-grouse habitat assessment to be used during land health evaluations (see Monitoring Framework, **Appendix D**). These habitat objectives are not obtainable on every acre within the designated GRSG habitat management areas. Therefore, the determination on

whether the objectives have been met will be based on the specific site's ecological ability to meet the desired condition identified in the table.

Ecological sites are the basic component of a land-type classification system that describes ecological potential and ecosystem dynamics of land areas. All land/land use types are identified within the ecological site system, including rangeland, pasture, and forest land. An ecological site is defined as a distinctive kind of land with specific soil and physical characteristics that differ from other kinds of land in its ability to produce a distinctive kind and amount of vegetation and its ability to respond similarly to management actions and natural disturbances. Lands are classified considering discrete physical and biotic factors. Physical factors include soils, climate, hydrology, geology, and physiographic features. Biotic factors include plant species occurrence, plant community compositions, annual biomass production, wildlife-vegetation interactions, and other factors. Ecological dynamics, primarily disturbance regimes, such as grazing; fire; drought; management actions; and all resulting interactions are also a primary factor of ecological sites. Information and data pertaining to a particular ecological site is organized into a reference document known as an Ecological Site Description (ESD). ESDs function as a primary repository of ecological knowledge regarding an ecological site. ESDs are maintained on the Natural Resources Conservation Service (NRCS) Ecological Site Information System (ESIS), which is the repository for information associated with ESDs and the collection of all site data (<https://esis.sc.egov.usda.gov/Welcome/pgESDWelcome.aspx>). The ESD can help interpret if a site's potential is less than or greater than the identified habitat objectives.

All BLM use authorizations will contain terms and conditions regarding the actions needed to meet or progress toward meeting the habitat objectives. If monitoring data show the habitat objectives have not been met nor progress being made towards meeting them, there will be an evaluation and a determination made as to the cause. If it is determined that the authorized use is a cause, the use will be adjusted by the response specified in the instrument that authorized the use.

Table 2-6 describes the seasonal habitat desired conditions for Greater Sage-Grouse.

2.3.3 Adaptive Management Strategy for Greater Sage-Grouse Habitat Management

Decisions

Adaptive Management is a decision process that promotes flexible resource management decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps with adjusting resource management directions as part of an iterative learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity. Adaptive management does not represent an end in itself, but rather a means to more effective decisions and enhanced benefits. On February 1, 2008, the USDI published its Adaptive Management Implementation Policy (522 DM 1). The adaptive management strategy presented within this EIS complies with this policy and direction. The GRSG Monitoring Framework will be used to inform adaptive management; the GRSG Monitoring Framework can be found in **Appendix D**. The following provides the BLM adaptive management strategy for the South Dakota ARMP.

Table 2-6
Seasonal Habitat Desired Conditions for Greater Sage-Grouse

Attribute	Indicator	Desired Condition
BREEDING HABITAT (LEK AND NESTING/EARLY BROOD REARING)		
Lek Security	Proximity of trees ^{7,13}	Trees absent or rare. When present trees consist of rocky mountain juniper and ponderosa pine > 328 feet (100 meters) from lek.
Lek Security	Proximity of sagebrush to leks ¹³	Adjacent protective sagebrush cover within 328 feet (100 m) of an occupied lek
NESTING/EARLY BROOD REARING^{5,10,12,13,14}		
	Sagebrush canopy cover ^{2,8,9,11}	2-20%
	Sagebrush height ⁸	4-12 inches (10.16-30.48 cm)
	Predominant sagebrush shape ¹³	Predominantly spreading shape ⁵
	Perennial grass cover (such as native rhizomatous and bunchgrasses) ^{2,8,13}	≥10%
	Perennial grass height (includes residual grasses) ^{8,9,11,13}	Adequate nest cover based on ecological site potential and seasonal precipitation. ¹⁵
	Perennial forb cover ^{2,8}	≥3%, Based on ecological site potential and seasonal precipitation
	Perennial forb availability ¹³	Preferred forbs are common with several species present ⁶
LATE BROOD-REARING/SUMMER¹ (July-October)¹ (Apply to all habitat outside of nesting/breeding and winter)		
	Sagebrush canopy cover ^{2,8}	2-20%
	Sagebrush height ⁸	4 - 12 inches (10.16-30.48 cm)
	Perennial grass canopy cover ^{2,8}	>10%
	Upland and riparian perennial forb availability ^{2,13}	Preferred forbs are common with several preferred species present ⁶ .
	Riparian meadow habitat condition	Proper Functioning Condition (PFC) ¹³
WINTER¹ November-March¹ (Apply to areas of known or likely winter-use)		
Cover and Food	Seasonal habitat extent ⁸	Winter habitat is managed to optimize its potential within the constraints of ecological site potential
	Sagebrush canopy cover ^{8,13}	2-20%
	Sagebrush height above snow ⁸	Winter habitat is managed to optimize its potential within the constraints of ecological site potential

NOTES AND REFERENCES

¹ Seasonal dates can be adjusted by local unit according to geographic region.

² Absolute cover is the actual recorded cover and can exceed 100% when recorded across all species and all layers. It is not relative cover, which is the proportions of each species, and equals 100%. Note that cover is reported for only those species (e.g., sagebrush, preferred forbs) that are sampled to determine suitability of habitat for sage-grouse. Overall cover at the site will be greater than that sampled for sage-grouse habitat, due to other species present. Percent cover refers to foliar cover, measured using the HAF protocol line-point intercept method.

³ Arid corresponds to the 10 – 12 inch precipitation zone; *Artemisia tridentata wyomingensis* is a common big sagebrush sub-species for this type site (Stiver et al. 2015 *In press*).

⁴ Mesic corresponds to the ≥12 inch precipitation zone.

⁵ Collectively the indicators for sagebrush (cover, height, and shape), perennial grass and perennial forb (cover, height and/or availability) represent the desired condition range for nesting/early brood rearing habitat characteristics, consistent with the breeding habitat suitability matrix identified in Stiver et al. 2015 *In press*. Sagebrush plants that are more tree or columnar-shaped provide less protective cover near the ground than sagebrush plants with a spreading shape (Stiver et al. 2015 *In press*). Some sagebrush plants are naturally columnar (e.g., Great Basin big sagebrush), and a natural part of the plant community. However, a predominance of columnar shape arising from animal impacts may warrant management investigation or adjustments at site specific scales.

⁶ Preferred forbs are listed in Stiver et al. 2015 *In press*. Overall total forb cover may be greater than that of preferred forb

Table 2-6
Seasonal Habitat Desired Conditions for Greater Sage-Grouse

cover since not all forb species are listed as preferred.

⁷Baruch-Mordo, S., J. S. Evans, J. P. Severson, D. E. Naugle, J. D. Maestas, J. M. Kiesecker, M. J. Falkowski, C. A. Hagen, and K. P. Reese. 2013. Saving sage-grouse from trees.

⁸Connelly, J. W., M. A. Schroeder, A. R. Sands, and C. E. Braun. 2000. Guidelines to manage sage-grouse populations and their habitats. *Wildlife Society Bulletin* 28:967-985.

⁹Connelly, J. W., K. P. Reese, and M. A. Schroeder. 2003. Monitoring of Greater sage-grouse habitats and populations. University of Idaho College of Natural Resources Experiment Station Bulletin 80. University of Idaho, Moscow, ID.

¹⁰Doherty, K. 2008. Sage-grouse and Energy Development: Integrating Science with Conservation Planning to Reduce Impacts. Ph.D. Dissertation. University of Montana, Missoula, MT.

¹¹Hagen, C. A., J. W. Connelly, and M. A. Schroeder. 2007. A meta-analysis of Greater Sage-Grouse *Centrocercus urophasianus* nesting and brood-rearing habitats. *Wildlife Biology* 13 (Supplement 1):42-50.

¹²Holloran, M. J., and S. H. Anderson. 2005. Spatial Distribution of Greater Sage-grouse nests in relatively contiguous sagebrush habitats. *Condor* 107:742-752.

¹³Stiver, S. J., E. T. Rinkes, D. E. Naugle, P. D. Makela, D. A. Nance, and J. W. Karl. *In press*. Sage-Grouse Habitat Assessment Framework: Multi-scale Habitat Assessment Tool. Bureau of Land Management and Western Association of Fish and Wildlife Agencies Technical Reference. U.S. Bureau of Land Management, Denver, Colorado.

¹⁴Connelly, J.W., A. Moser, and D. Kemner. 2013. Greater Sage-Grouse breeding habitats: Landscape-based comparisons. *Grouse News* 45. Research Reports.

¹⁵Specific height requirements needed to meet the objective will be set when project level planning is completed.

Adaptive Management and Monitoring

This EIS contains a monitoring framework plan (**Appendix D**) that includes an effectiveness monitoring component. The agencies intend to use the data collected from the effectiveness monitoring to identify any changes in habitat conditions related to the goals and objectives of the plan and other range-wide conservation strategies (BLM 2004; Stiver et al. 2006; USFWS 2013). The information collected through the Monitoring Framework Plan (**Appendix D**) will be used by the BLM to determine when adaptive management hard and soft triggers (discussed below) are met. Adaptive management responses at the RMP level were included as part of the assumptions when impacts were analyzed in Chapter 4 of the Proposed RMP. In making amendments to this plan, the BLM will coordinate with the FWS as BLM continues to meet its objective of conserving, enhancing and restoring GRSG habitat by reducing, minimizing or eliminating threats to that habitat. The GRSG adaptive management plan provides a means of addressing and responding to unintended negative impacts on GRSG and its habitat before consequences become severe or irreversible.

The hard and soft trigger data will be analyzed as soon as it becomes available after the signing of the ROD and then at a minimum, analyzed annually thereafter.

Adaptive Management Triggers

Adaptive management triggers are essential for identifying when potential management changes are needed in order to continue meeting Greater Sage-Grouse conservation objectives. The BLM will use soft and hard triggers.

Soft Triggers

Soft triggers are indicators that management or specific activities may not be achieving the intended results of conservation actions. The soft trigger is any negative deviation from normal trends in habitat or population in any given year, or if observed across two to three consecutive years. Metrics include, but are not limited to, annual lek counts, wing counts, aerial surveys, habitat monitoring, and Density and Disturbance Calculation Tool (DDCT) evaluations. BLM field offices, local SDGFP offices, and sage-

grouse working groups will evaluate the metrics. The purpose of these strategies is to address localized Greater Sage-Grouse population and habitat changes by providing the framework in which management will change if monitoring identifies negative population trends and habitat anomalies.

Each major project (EIS level) will include adaptive management strategies in support of the population management objectives for Greater Sage-Grouse set by the State of South Dakota, and will be consistent with this Greater Sage-Grouse Adaptive Management Plan. These adaptive management strategies will be developed in partnership with the State of South Dakota, project proponents, partners, and stakeholders, incorporating the best available science.

Soft Triggers Response

Soft triggers require immediate monitoring and surveillance to determine causal factors and may require curtailment of activities in the short or long term, as allowed by law. The project-level adaptive management strategies will identify appropriate responses where the project's activities are identified as the causal factor. The management agency and the adaptive management group will implement an appropriate response strategy to address causal factors not addressed by specific project adaptive management strategies, not attributable to a specific project, or to make adjustments at a larger regional or state-wide level.

Hard Triggers

Hard triggers are indicators that management is not achieving desired conservation results. Hard triggers would be considered a catastrophic indicator that the species is not responding to conservation actions, or that a larger-scale impact is having a negative effect. Hard triggers are focused on three metrics: 1) number of active leks, 2) acres of available habitat, and 3) population trends based on annual lek counts. Within the context of normal population variables, hard triggers shall be determined to take effect when two of the three metrics exceeds 60% of normal variability for the BSU in a single year, or when any of the three metrics exceeds 40% of normal variability for a three-year time period within a five-year range of analysis. A minimum of three years is used to determine trends, with a five-year period preferred to allow determination of three actual time periods (i.e., Y1-2-3, Y2-3-4, Y3-4-5). Baseline population estimates are established by pre-disturbance surveys, reference surveys, and account for regional and statewide trends in population levels. Population count data in South Dakota are maintained by SDGFP. Estimates of population are determined based upon survey protocols determined by SDGFP, and are implemented consistently throughout the state. Population counts are tracked for individual leks and are then summarized by county and for the state.

Hard Trigger Response

Hard triggers represent a threshold indicating that immediate action is necessary to stop a severe deviation from Greater Sage-Grouse conservation objectives set forth in the BLM plans. As such, the ARMP includes a "hard-wired" plan-level response; that is, it provides that, upon reaching the trigger, a more restrictive alternative, or an appropriate component of a more restrictive alternative analyzed in the Proposed RMP and Final EIS, will be implemented without further action by the BLM. Specific "hard-wired" changes in management are identified in **Table 2-7**, Specific Management Responses, below. In addition to the specific changes identified in **Table 2-7**, the BLM will review available and pertinent data, in coordination with Greater Sage-Grouse biologists and managers from multiple agencies, including the USFWS, NRCS, and the State of South Dakota, to determine the causal factor(s) and implement a

Table 2-7
Specific Management Responses

Program	Adaptive Management Response¹
Sage-Grouse Management	Areas within and adjacent to PHMA where a hard trigger has been reached would be the top priority for regional mitigation habitat restoration and fuels reduction treatments.
Vegetation Management	PHMA would be the top priority for regional mitigation, habitat restoration, and fuels reduction treatments.
Wildland Fire Management	Reassess GRSG habitat needs to determine if priorities for at-risk habitats, fuels management areas, preparedness, suppression, and restoration have changed.
Livestock Grazing	For areas not achieving the GRSG habitat objectives due to grazing, apply adjustments to livestock grazing to achieve objectives. Actions would include increased monitoring, changes to season of use or timing of grazing, changes to livestock numbers and intensity of grazing, changes to stocking rates, installation or removal of range improvements.
Rights-of-Way – Existing Corridors	ROW avoidance areas. If allowed, placement of proposed ROWs next to existing ROWs when feasible. Proposed above ground power lines that can be safely buried would be buried.
Wind Energy Development	No wind energy development would be allowed in PHMA as these areas are exclusion areas. Wind energy applications could be denied in all avoidance areas in GHMA.
Industrial Solar	No solar energy development would be allowed in PHMA as these areas are exclusion areas. Solar energy applications could be denied in all avoidance areas in GHMA.
Comprehensive Travel and Transportation Management	<p>If travel management planning has not been completed within GRSG habitat, PHMA areas where the hard trigger was met would be the highest priority for future travel management planning efforts.</p> <p>If travel management has been completed within GRSG habitat in the PHMA where the hard trigger was met, re-evaluate designated routes to determine their effects on GRSG. If routes are found to be causing population-level impacts, revise their designation status to reduce the effect.</p>
Fluid Minerals	New leases may be deferred and/or additional mitigation required. Ongoing operations may be suspended, including wells shut in, until the impacts that tripped a hard trigger are resolved.
Locatable Minerals	New operations would be evaluated for impacts and mitigation would be required within the limits of BLM's authority as defined in 43 CFR, Part 3715 and 43 CFR, Part 3800.
Salable Minerals	BLM may deny application for new permits or additional mitigation may be required. Ongoing operations may be suspended until the impacts that tripped a hard trigger are resolved.
Nonenergy Leasable Minerals and Coal	BLM may deny new applications for leases, additional mitigation may be required. Ongoing operations may be suspended until the impacts that tripped a hard trigger are resolved.

¹ The responses listed above would be implemented in a manner that honors valid, existing rights.

corrective strategy. The corrective strategy would include the changes identified in **Table 2-7** and could also include the need to amend or revise the ARMP to address the situation and modify management accordingly.

Upon determination that a hard trigger has been tripped, the BLM will immediately defer issuance of discretionary authorizations for new actions within the BSU for a period of 90 days. When a hard trigger is hit in a BSU, including those that cross state lines, the WAFWA Management Zone Greater Sage-Grouse Conservation Team will convene to determine the casual factor(s), put project level responses in place, as appropriate, and discuss further appropriate actions to be applied.

In addition to implementing the hard wired plan-level response, in the event that new scientific information becomes available demonstrating that the hard-wired response would be insufficient to stop a severe deviation from sage-grouse conservation objectives set forth in the BLM plans, the BLM will immediately implement a formal directive to protect GRSG and its habitat and to ensure that conservation options are not foreclosed. To the extent that it is supported scientifically, this formal directive will be drawn from the range of alternatives analyzed in the RMP Amendments/Revisions.

Mitigation for Sage-Grouse Management

Consistent with the Plan's goal, the intent of the South Dakota ARMP is to provide a net conservation gain to the species. In all sage-grouse habitat, in undertaking BLM management actions, and, consistent with valid existing rights and applicable law, in authorizing third-party actions that result in sage-grouse habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species, including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions.

Actions that result in habitat loss and degradation including those identified as threats which contribute to Greater Sage-Grouse disturbance as identified by the USFWS in its 2010 listing decision (75 FR 13910) and shown in Table 2 in the attached Monitoring Framework (**Appendix D**). This is also consistent with BLM Manual 6840 – Special Status Species Management, Section .02B, which directs BLM “to initiate proactive conservation measures that reduce or eliminate threats to Bureau sensitive species to minimize the likelihood of the need for listing of these species under the ESA.”

Mitigation Standards. In undertaking BLM management actions, and, consistent with valid existing rights and applicable law, in authorizing-third party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species, including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions. Mitigation will follow the regulations from the CEQ (40 CFR, Part 1508.20; e.g., avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy. If impacts from BLM management actions and authorized third-party actions that result in habitat loss and degradation remain after applying avoidance and minimization measures (i.e., residual impacts), then compensatory mitigation projects will be used to provide a net conservation gain to the species. Any compensatory mitigation will be durable, timely, and in addition to that which would have resulted without the compensatory mitigation.

Greater Sage-Grouse Conservation Team. The BLM will establish a WAFWA Management Zone Greater Sage-Grouse Conservation Team (hereafter, Team) to help guide the conservation of Greater Sage-Grouse, within 90 days of the issuance of the ROD. This Team will develop a WAFWA Management Zone Regional Mitigation Strategy (hereafter, Regional Mitigation Strategy). The Team will also compile and report on monitoring data (including data on habitat condition, population trends, and mitigation effectiveness) from States across the WAFWA Management Zone (see Monitoring section). Subsequently, the Team will use these data to either modify the appropriate Regional Mitigation Strategy or recommend adaptive management actions (see Adaptive Management section).

The BLM will invite governmental and Tribal partners to participate in this Team, including the SDGFP and USFWS, in compliance with the exemptions provided for committees defined in the Federal Advisory Committee Act and the regulations that implement that act. The BLM will strive for a collaborative and unified approach between Federal agencies, Tribal governments, state and local government(s), and other stakeholders for Greater Sage-Grouse conservation. The Team will provide advice, and will not make any decisions that impact Federal lands. The BLM will remain responsible for making decisions that affect Federal lands.

Developing a Regional Mitigation Strategy. The Team will develop a Regional Mitigation Strategy to inform the mitigation components of NEPA analyses for BLM management actions and third-party actions that result in habitat loss and degradation. The Strategy will be developed within one year of the issuance of the ROD. The BLM's Regional Mitigation Manual MS-1794 will serve as a framework for developing the Regional Mitigation Strategy. The Regional Mitigation Strategy will be applicable to the States/Field Offices within the WAFWA Management Zone's boundaries.

Regional mitigation is a landscape-scale approach to mitigating impacts on resources. This involves anticipating future mitigation needs and strategically identifying mitigation sites and measures that can provide a net conservation gain to the species. The Regional Mitigation Strategy developed by the Team will elaborate on the components identified above (i.e., avoidance, minimization, and compensation; additionality, timeliness, and durability).

In the time period before the Strategy is developed, BLM will consider regional conditions, trends, and sites, to the greatest extent possible, when applying the mitigation hierarchy and will ensure that mitigation is consistent with the standards set forth in the first paragraph of this section.

Incorporating the Regional Mitigation Strategy into NEPA Analyses. The BLM will include the avoidance, minimization, and compensatory recommendations from the Regional Mitigation Strategy in one or more of the NEPA analysis' alternatives for BLM management actions and third-party actions that result in habitat loss and degradation, and the appropriate mitigation actions will be carried forward into the decision.

Implementing a Compensatory Mitigation Program. Consistent with the principles identified above, the BLM needs to ensure that compensatory mitigation is strategically implemented to provide a net conservation gain to the species, as identified in the Regional Mitigation Strategy. To align with existing compensatory mitigation efforts, this compensatory mitigation program will be implemented at a State level (as opposed to a WAFWA Management Zone, a Field Office, or a Forest), in collaboration with our partners (e.g., Federal, Tribal, and State agencies).

To ensure transparent and effective management of the compensatory mitigation funds, the BLM will enter into a contract or agreement with a third-party to help manage the State-level compensatory mitigation funds, within one year of the issuance of the ROD. The selection of the third-party compensatory mitigation administrator will conform to all relevant laws, regulations, and policies. The BLM will remain responsible for making decisions that affect Federal lands. Information on BMPs, Guidelines and SOPs can be found in **Appendix J**. RDFs are described in **Appendix C**.

Monitoring Framework for Greater Sage-Grouse Habitat Management

The BLM's planning regulations, specifically 43 CFR, Part 1610.4-9, require that land use plans establish intervals and standards for monitoring based on the sensitivity of the resource decisions. Land use plan monitoring is the process of tracking the implementation of land use plan decisions (implementation monitoring) and collecting data/information necessary to evaluate the effectiveness of land use plan decisions (effectiveness monitoring). For GRSG, these types of monitoring are also described in the criteria found in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (50 CFR Vol. 68, No. 60). One of the Policy for Evaluation of Conservation Efforts When Making Listing Decisions criteria evaluates whether provisions for monitoring and reporting progress on implementation (based on compliance with the implementation schedule) and effectiveness (based on evaluation of quantifiable parameters) of the conservation effort are provided. The Monitoring Framework is located in **Appendix D**.

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CHAPTER 3

APPROVED RESOURCE MANAGEMENT PLAN

3.1 APPROVED RESOURCE MANAGEMENT PLAN DECISIONS

The ARMP is now the baseline management plan for the SDFO. Once an RMP is approved, a plan may be changed through amendment. An amendment is initiated by the need to consider monitoring and evaluation findings, new data, new or revised policy, or a change in circumstances. It may also be initiated by a proposed action that may change the scope of resource uses or the terms, conditions, and decisions of the approved plan. If the BLM were to propose to amend the plan, the process would follow the same procedure required for preparing and approving the plan, but the focus would be limited to that portion of the plan being amended (43 CFR, Part 1610.5-5).

The BLM decisions proposed in this document apply only to BLM-administered surface and mineral estate acres. This will include the BLM-administered mineral estate that is under private land, which is commonly referred to as split-estate. This ARMP does not include planning or management decisions for lands or minerals privately owned, owned by the State of South Dakota, owned by local governments, or administered by other federal agencies. The management decisions apply to the entire planning area, including ACECs and the exemption area, unless otherwise stated in the Special Designations Section for each ACEC or sections that specifically address the exemption area.

This ARMP includes Alternative D of the Proposed South Dakota RMP and Final EIS, which was published on May 29, 2014. This section describes the management decisions for the SDFO, which replace the relevant decisions in the 1986 South Dakota RMP. For a description of the physical, biological, cultural, economic and social conditions of the South Dakota planning area, refer to the Proposed RMP/Final EIS (BLM 2015), Internet website http://www.blm.gov/mt/st/en/fo/south_dakota_field/rmp.html.

The BLM decisions in this document do not change existing rights or authorizations (e.g., terms and conditions of existing oil and gas leases or ROWs). However, post-lease actions or authorizations (e.g., application for permit to drill [APD], road ROWs, pipeline ROWs) could be subject to mitigation measures, as necessary. This would be consistent with the decisions, on a case-by-case basis and as required through project-specific NEPA analysis or other environmental review. The stipulations or COAs are in accordance with applicable laws, regulations, and, if applicable, lease terms.

All future resource authorizations and actions in GRSG habitat will conform to or be consistent with the decisions contained in this ARMP. All existing operations and activities authorized under permits, contracts, cooperative agreements, or other authorizations will be modified, as necessary, to conform to this plan within a reasonable time frame. However, this ARMP does not repeal valid existing rights on public lands. A valid existing right is a claim or authorization that takes precedence over the decisions developed in this plan. If such authorizations come up for review and can be modified, they will also be brought into conformance with this plan.

While the Final South Dakota Field Office Plan constitutes compliance with NEPA for the broad-scale decisions made in this ARMP, the BLM will continue to prepare environmental assessments (EAs) and EISs where appropriate as part of implementation level planning and decision-making.

3.2 GOALS, OBJECTIVES, AND MANAGEMENT DECISIONS

This section presents the goals, objectives, land use allocations, and management decisions established for protecting and preserving resources on public lands managed by the BLM in the SDFO.

This section presents the goals, objectives, land use allocations, and management decisions established for protecting and preserving resources on public lands managed by the BLM in the SDFO. These management decisions are presented by program area and combine Alternative D and the Decisions Common to All Alternatives of the South Dakota Proposed RMP and Final EIS (BLM 2015). Refer to Section 2 for Management Actions specific to GRSG. .

3.2.1 Air Resources

Goal 1: *Ensure BLM authorizations and management activities protect the local quality of life and sustain economic benefits by complying with tribal, local, county, state, and federal air quality regulations, requirements, and implementation plans.*

Goal 2: *Meet federal and state air quality standards.*

Management Decisions

MD-1: O&G - CSU: Tier 4 engine requirements for oil and gas drilling and completion activities will be addressed through a CSU as follows: Surface occupancy or use is subject to the following special operating constraint: Ensure that each diesel-fueled non-road engine with greater than 200 horsepower (hp) design rating to be used during drilling or completion activities meets one of the following two criteria: (1) the engine was manufactured to meet US Environmental Protection Agency (USEPA) nitrogen oxides (NO_x) emission standards for Tier 4 non-road diesel engines, or (2) the engine emits NO_x at rates less than or equal to EPA emission standards for Tier 4 non-road diesel engines. Refer to **Appendix G**.

MD-2: All resource uses will be managed to meet the Rangeland Health Standards for air quality

MD-3: Management will protect air quality throughout the planning area by adapting current BMPs and developing and applying mitigation measures, when necessary.

MD-4: Coordinate with regulatory agencies to meet air quality standards.

MD-5: A Lease Notice will be applied to all leases stating the lessee/operator is given notice that prior to project-specific approval, additional air resource analyses may be required in order to comply with NEPA, FLPMA, and/or other applicable laws and regulations Refer to **Appendix G**.

3.2.2 Climate

Goal 1: *Evaluate the observed and anticipated long-term dynamic of climate change and minimize the impact of greenhouse gases (GHG) from projects to the degree practicable and reasonably foreseeable.*

Goal 2: *Provide for diverse, healthy ecosystems that are resilient to stresses such as climate change.*

Goal 3: *Provide for flexible, adaptable management that allows for timely responses to changing climatic conditions.*

Goal 4: *Maintain or improve the ability of BLM lands to reduce (sequester) atmospheric GHG.*

Management Decisions

MD-1: BLM authorized actions will consider methods to decrease GHG emissions.

MD-2: Priority will be placed on actions that reduce or mitigate GHG emissions by actions such as: enhanced energy efficiency, use of lower GHG-emitting technologies, or renewable energy, planning for carbon capture and sequestration, and the capture or beneficial use of fugitive methane emissions.

MD-3: Promote vegetative capture and storage of carbon, with consideration for resource objectives, by implementing Rangeland Health Standards and Guidelines and soil, monitoring, and vegetation BMPs at the project planning and implementation level (**Appendix J**).

MD-4: Adjust the timing of BLM authorized activities as needed, to accommodate long-term changes in seasonal weather patterns while considering the impacts of adjustments to other resources and resource uses.

3.2.3 Soil Resources

Goal 1: *Manage uses to minimize soil erosion, sedimentation to water sources, and compaction; and to maintain surface soil water infiltration based on site-specific conditions.*

Goal 2: *Maintain, improve, or restore soil health and productivity while supporting multiple use management.*

Goal 3: *Soils are stable and provide for capture, storage, and release of water, appropriate to soil type, climate, and land form.*

Goal 4: *Soils are productive and support vegetation that provides forage, wildlife habitat, watershed protection, and esthetic characteristic based on soil type.*

Management Decisions

MD-1: Vegetation treatments and livestock grazing will be allowed on sensitive soils provided BMPs and Guidelines are followed and these activities are conducted in a manner consistent with the vegetation, soil and water goals of this plan.

Surface disturbing and disruptive activities will be allowed if the project proponent can clearly demonstrate that the impacts can be adequately mitigated, relevant BMPs, Guidelines or needed design features are included and such activities are conducted in a manner consistent with the vegetation, soil and water goals of this plan. Refer to glossary for definition of surface disturbing and disruptive activities.

O&G – CSU: Surface occupancy and use will be controlled on sensitive soils. Prior to surface disturbance on sensitive soils, a reclamation plan must be approved by the administrative officer. The plan must demonstrate the following: (1) no other practicable alternatives exist for relocating the activity, (2) the activity will be located to reduce impacts on soil and water resources, (3) site productivity will be maintained or restored, (4) surface runoff and sedimentation will be adequately controlled, (5) on- and off-site areas will be protected from accelerated erosion, (6) that no areas susceptible to mass wasting will be disturbed and (7) surface-disturbing activities will be prohibited during extended wet periods. Waivers, exceptions, and modifications (WEM) are described in **Appendix G**.

Sensitive soils determined using a combination of slope and soil erodibility which includes slopes 25% or greater.

MD-2: Sensitive soils are ROWs avoidance areas for all types of ROWs, including renewable energy development.

MD-3: Surface disturbing and disruptive activities: Surface disturbing and disruptive activities will be allowed in badlands and rock outcrops if the impacts can be adequately mitigated, relevant BMPs, Guidelines or needed design features to reduce erosion are included and the activities will not compromise the goals of this plan.

O&G - NSO: Surface occupancy and use is prohibited on badlands and rock outcrop. WEMs described in **Appendix G**.

MD-4: Badland and rock outcrops are ROW avoidance areas.

MD-5: Road and trail restrictions will be used on routes not necessary for management when soil health will be adversely impacted. Roads may be closed and reclaimed if necessary. The AO will consult with other users outside the BLM to determine which roads and trails should remain open for their management and public safety.

MD-6: BMPs will be implemented at a site-specific project level to maintain or improve soil resources (**Appendix J**).

MD-7: BLM will reclaim/reseed disturbed areas as needed to maintain or improve soil health and stability.

MD-8: Rangeland Health Standards will be implemented to maintain and conserve soil resources and productivity.

MD-9: Authorizations will be denied in areas where erosion could not be effectively controlled/mitigated; and reclamation to BLM program-specific standards are likely to be unsuccessful.

MD-10: BMPs and Guidelines will include the BMPs described in **Appendix J**, South Dakota Field Office Reclamation Guidelines – **Appendix L**, South Dakota Field Office Soil Monitoring Guidelines – **Appendix O**, and South Dakota Field Office Mitigation Guidelines – **Appendices F and K**, and Sage-Grouse Conservation Decisions in **Appendices C, F, and J**.

MD-11: Mitigation of surface-disturbing or disruptive activities will be applied where needed to minimize impacts of human activities in sensitive soils consistent with the stipulations outlined in this section.

MD-12: Mitigation measures will be applied on a case-by-case basis during activity level planning if review of the project area indicates that sensitive soils are present or will be affected consistent with the management decisions and restrictions found in this section and the Guidelines and BMPs listed in **Appendix J**. Exceptions to restriction requirements may be granted by the AO if an environmental review demonstrates that effects could be mitigated to an acceptable level. Exceptions may also be granted where the short-term effects are mitigated by the long-term benefits (e.g., riparian restoration projects, prescribed fire, or vegetation treatments).

3.2.4 Water Resources

Goal 1: *Maintain or improve the chemical, physical, and biological integrity of water resources to protect designated beneficial uses and achieve water quality standards and guidelines.*

Goal 2: *Improve watershed function to minimize erosion and accelerated runoff to streams.*

Goal 3: *Maintain or improve water quality for municipal, industrial, agricultural, biological, recreational and residential purposes.*

Goal 4: *Maintain or improve stream channel shape, form, and function within the natural range of variability to allow for hydrological processes that can fully support beneficial uses.*

Goal 5: *Maintain existing or acquire new water rights on BLM lands to ensure water availability for multiple use management while adhering to the State of South Dakota water rights, and other water quality related laws and regulations.*

Goal 6: *Protect ground and surface water quantity and quality.*

Goal 7: *Meet water quality standards without adversely affecting prior existing water rights and uses and protect beneficial uses of water.*

Management Decisions

MD-1: Perennial or intermittent streams, 100 year floodplains, wetlands, lakes, ponds, reservoirs and riparian areas.

Surface disturbing and disruptive activities will be allowed in in these areas if the project proponent can demonstrate that adverse impacts can be adequately mitigated, relevant BMPs, guidelines, conservation actions or needed design features are included and the goals of this plan not compromised.

Vegetation treatments and livestock grazing will be allowed in these areas provided Standards for Rangeland health are met, BMPs and Guidelines are followed.

Projects to improve or maintain resource conditions or recreational opportunities may be allowed in these areas pending project level environmental review and mitigation of impacts.

O&G – NSO: Surface occupancy and use is prohibited within perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas. Applicable WEMs are described in **Appendix G**.

MD-2: Surface disturbing and disruptive activities will be allowed within 300 feet of perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas if adverse impacts can be adequately mitigated, Mitigation, RDFs, BMPs and Guidelines RDFs (Appendices B through G, and I through K) are used and the goals of this plan not compromised.

Projects to improve or maintain resource conditions or recreational opportunities may be allowed pending project level environmental review and mitigation.

O&G - CSU: Surface occupancy and use will be controlled within 300 feet of riparian and/or wetland areas. Surface-disturbing activities will require a plan with design features that demonstrate how all actions will maintain and/or improve the functionality of riparian/wetland areas. The plan will address: (a) potential impacts on riparian and wetland resources, (b) mitigation to reduce impacts to acceptable levels (including timing restrictions), (c) post project restoration, and (d) monitoring (the operator must conduct monitoring capable detecting early signs of changing riparian and/or wetland conditions). Applicable WEMs are described in **Appendix G**.

MD-3: ROWs in Streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas.

Perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas will be managed as ROWs avoidance areas for all types of ROWs including renewable energy development. Linear ROWs may be allowed across these areas if no other feasible option is available. BLM will require off site mitigation prior to approving ROWs in these areas.

MD-4: Surface disturbing and disruptive activities will be allowed within State-designated source water protection areas (pending consultation with the State and Counties) if adverse impacts can be adequately mitigated, relevant soil and water BMPs and Guidelines are followed (Appendices J) and water quality will not be adversely impacted.

O&G - NSO: Surface occupancy and use will be prohibited within State-designated Source Water Protection Areas. WEMs are described in **Appendix G**. Prior to approval of any WEMs BLM will consult with the State of South Dakota.

MD-5: ROWs - Source water protection areas will be ROW avoidance areas for renewable energy and other types of ROWs.

MD-6: BLM will utilize road and trail restrictions on routes not necessary for management when water quality is likely to be adversely impacted. Roads could be closed and reclaimed if necessary. The AO will

consult with the public, including other users and affected parties to determine which roads and trails should remain open for their management and public safety.

MD-7: Rangeland Health Standards and BMPs will be implemented to protect beneficial uses of water.

MD-8: Projects (including mining plans) will be reviewed and current BMPs with mitigation measures adapted and applied to minimize impacts on water quality (see Appendices J and K).

MD-9: BLM will continue working in coordination with local, county, state, tribal and federal agencies, private landowners, water companies and organizations to meet Total Maximum Daily Load goals.

MD-10: Burned areas will be monitored for weed infestations, flow alterations, and accelerated soil erosion. Where sedimentation impacts on adjacent streams are likely, erosion will be mitigated.

MD-11: Mitigation of surface-disturbing or disruptive activities will be applied where needed to minimize impacts of human activities in riparian areas, 100 year floodplains of rivers, areas with hydric soils, water bodies and streams consistent with the management actions and restrictions outlined in this section and the Guidelines and BMPs listed in **Appendix J**. Mitigation measures will be applied on a case-by-case basis during activity level planning if the review of the project area indicates that riparian areas, 100 year floodplains of major rivers, and water bodies and streams are present or will be affected. Exceptions to stipulation requirements may be granted by the AO if an environmental review demonstrates that effects could be mitigated to an acceptable level. Frequently flooded soils data set (NRCS) will be used for initial identification of floodplains and other features unless 100 year flood plains are delineated. Exceptions may also be granted where the short-term effects are mitigated by the long-term benefits (e.g., riparian restoration projects, prescribed fire, or vegetation treatments).

3.2.5 Vegetation Communities

Goal 1: *Manage public lands to provide plant communities that support the integrity of the ecological processes (water, energy, and nutrient cycles) and to provide forage, watershed protection, and a variety of wildlife habitat.*

Goal 2: *Public lands meet the Dakotas Standards for Rangeland Health (**Appendix J**).*

Goal 3: *A variety of habitat is present with a diverse assemblage of native plant communities indicative of the Northern Great Plains.*

Goal 4: *Native plants dominate the planning area and are resistant to invasive plants, noxious weeds, and invasive pests.*

Goal 5: *The abundance of woody vegetation is maintained or improved on those riparian sites that have the potential to support woody vegetation.*

Goal 6: *Stands of oak, aspen, box elder, ash and other hardwoods are maintained and a variety of age classes are present.*

Goal 7: *In Greater sage-grouse PHMA, the desired condition is to maintain all lands ecologically capable of producing sagebrush (but no less than 70%) with a minimum of 15% sagebrush cover or as consistent with*

specific ecological site conditions. The attributes necessary to sustain these habitats are described in Interpreting Indicators of Rangeland Health (BLM Tech Ref 1734-6).

Management Decisions

MD-1: Vegetation treatments used to achieve desired plant communities could include mechanical, prescribed fire, chemical treatments, grazing, seeding or planting. Any mechanical treatments within big sagebrush habitat crucial to sagebrush obligate species will be carried out to enhance that resource.

MD-2: Conversion of native vegetation to tame pastures will only be allowed to improve, maintain, or protect habitat, sensitive soils, riparian vegetation or special status plants or animals during vulnerable periods and in cases where alternative forage sources are needed to defer or change livestock grazing patterns to reduce disturbance to wildlife. Vegetation type conversion proposals will be evaluated at the project level. No more than 1% (2,740 acres) of the public land in the planning area could be converted to non-invasive introduced species over the next 20 years.

MD-3: Priority for funding and implementing range improvements will be given to projects that improve multiple resources.

MD-4: The use of native species will be the preferred method of revegetating disturbed sites. Non-invasive introduced species that pose little threat of displacing adjacent native vegetative communities could be used to restore vegetation including but not limited to the following circumstances:

- 1) Emergency rehabilitation is needed to control erosion or weed invasion and native seed is not available
- 2) A non-native nurse crop is needed to establish native vegetation
- 3) The presence of a problematic soil (as defined in glossary) or severe loss of top soil on a disturbed site make re-establishment of native vegetation unlikely.

MD-5: BLM will not designate specific sites for plant gathering except in cases when a specific site designation is needed to limit impacts on plants or other resources. Plant gathering for incidental use will be allowed, except that only above ground gathering will be allowed in the Fort Meade ACEC (refer to **Section 3, Figure 3-3**) and Fossil Cycad ACEC (Refer to **Section 3, Figure 3-4**) and BLM could restrict gathering within areas if an Interdisciplinary Team determines through monitoring that gathering is causing negative impacts on resources within gathering areas.

MD-6: Management decisions on BLM lands will be consistent with achieving the Dakotas Standards for Rangeland Health and Guidelines for Livestock Grazing Management (**Appendix J**).

MD-7: BLM will complete assessments for rangeland health on a priority allotment basis with emphasis on allotments with significant acreage of public land, Special Status Species, and resource problems or issues (e.g., I and M category allotments).

MD-8: Allocation of forage will be based on benefits to livestock grazing, wildlife, watershed protection, and ecological processes.

MD-9: Use of forest products, including firewood, posts, poles, saw timber, Christmas trees, and other special forest products will be allowed by permit.

MD-10: Gathering of plants and plant parts will be allowed for incidental use unless otherwise restricted. Gathering is limited to above ground at the Fort Meade ACEC. This does not apply to fire wood gathering. Refer to the Special Designation section for direction specific to ACECs.

MD-11: Old growth forested stands will not be identified; however, characteristics such as large, old trees will be considered in treatments. The BLM will manage for multiple age classes of shrubs and trees.

MD-12: Treatments will be designed to decrease the presence of or reduce the susceptibility to invasion by invasive plants and pests and noxious weeds. Treat areas that contain cheatgrass and other invasive or noxious species to minimize competition and favor establishment of desired species.

MD-13: Riparian and wetland communities, habitat, and associated uplands will be treated and restored through implementation of livestock grazing guidelines to meet Dakotas Standards for Rangeland Health (**Appendix J**).

MD-14: Where riparian and wetland areas are already meeting standards they will be maintained in that condition or better. Where a site's capability is less than PFC BLM will manage to achieve or move towards capability.

MD-15: Maintain and/or improve desired mix of seral stages within vegetation communities including forest and woodlands, grasslands, shrublands and riparian/wetlands.

MD-16: BLM will consider the potential impacts of climate change on disturbed or degraded areas when determining the type of reclamation or the seed mix needed for reclamation.

MD-17: The use of native plant species will be the preferred method used to revegetate or reclaim areas. If non-native species are used, the seed mix will be evaluated and approved by an interdisciplinary team prior to use to ensure that it has a low probability of displacing adjacent native vegetation.

MD-18: Mitigation measures will be applied on a case-by-case basis during activity level planning to protect or maintain desired vegetation types including special status plant species consistent with the management decisions and restrictions found in this section and the Guidelines and BMPs listed in **Appendix J**. Exceptions to restriction requirements may be granted by the AO if an environmental review demonstrates that effects could be mitigated to an acceptable level. Exceptions may also be granted where the short-term effects are mitigated by the long-term benefits (e.g., riparian restoration projects, prescribed fire, or vegetation treatments).

3.2.6 Noxious Weeds and Other Invasive Non-Native Species

Goal 1: *Minimize infestation of noxious weeds.*

Goal 2: *Reduce existing acres infested by invasive plants and noxious weeds through IPM treatment methods including restoration and elimination of new infestations through early detection and rapid response.*

Goal 3: *New infestations are not common and existing infestations are declining across the landscape.*

Goal 4: *Invasive plants and noxious weeds are not leading to a decrease in acres that are meeting Standards for Rangeland Health.*

Management Decisions

MD-1: Herbicide treatments limited to spot treatments within suitable nesting or brood rearing habitat, within a 3 mile buffer zone, of known sage-grouse leks from March 1-June 30. Exceptions to treatment types and dates of treatments may be allowed to address aggressively spreading weeds or invasive plants (MT Category I weeds) that require aggressive and timely treatment during this period following consultation with necessary specialists to minimize impacts on sage-grouse.

MD-2: Herbicide treatments limited to spot treatments within suitable nesting or brood rearing habitat of known sage-grouse leks from March 1 – June 30. Exceptions to treatment types and dates of treatments may be allowed to address aggressively spreading weeds or invasive plants (MT Category I weeds) that require aggressive and timely treatment during this period following consultation with necessary specialists to minimize impacts on sage-grouse.

MD-3: One quarter mile herbicide weed treatment restriction zone around current year active raptor nesting site (including bald eagles) from March 1-August 1. Exceptions may be allowed to address aggressively spreading weeds or invasive plants (MT Category I weeds) that require treatment during this period following consultation with necessary specialists for timing of least impacts on raptors.

MD-4: Poisonous plants could be treated, where found, using IPM methods.

MD-5: Listed T&E and sensitive plant species will have a 100 foot herbicide buffer zone. Any herbicides applied in this buffer will be applied by spot treatment only unless broadcast treatment will not have adverse impacts on such species. Exceptions to treatment types may be allowed to address aggressively spreading weeds or invasive plants (MT Category I weeds) that require aggressive and timely treatment during this period following consultation with necessary specialists to minimize impacts on sensitive status species.

MD-6: BLM will not designate specific sites or areas for native plant gathering except in cases when a specific site designation is needed to limit impacts on plants and high value resources (refer to glossary). Plant gathering for incidental or casual use will be allowed, except that only above ground gathering will be allowed in the Fossil Cycad ACEC and Fort Meade ACEC. Gathering of fire wood is allowed through a permit or allowed as casual or incidental use (refer to glossary) for camping and other uses if the gathering is within casual or incidental use definitions. BLM could restrict gathering in some areas if an Interdisciplinary Team determines that gathering is causing negative impacts on resources or gathering is likely to adversely impact a special status species plant or plants listed as rare by the state of South Dakota. Refer to the Special Designation section for additional information about plant gathering in ACECs. Refer to Special status species for information about Special Status Plants.

MD-7: BLM will work cooperatively, and in coordination with federal, state, and county agencies, private landowners, and organizations to prevent and treat invasive plant species, including noxious weeds.

MD-8: Use of a combination of IPM methods and treatment practices for weed management.

MD-9: Weed management SOPs and BMPs will be included in all new treatment projects and incorporated, where possible, into existing contracts, agreements and land use authorizations which result in ground disturbing activities (**Appendix J**).

MD-10: Certified weed seed free forage (hay and grains) straw and mulch will be required for all activities when used on BLM lands (exceptions could be made for emergencies when approved by the BLM AO).

MD-11: Reestablish perennial vegetation using native species in rehabilitation and reclamation unless site-specific evaluations indicate that non-native species are needed to ensure success or rapid vegetation reestablishment. If non-native species are used, the seed mix will be evaluated by an interdisciplinary team prior to use to ensure that it has a low probability of displacing adjacent native vegetation.

MD-12: Monitoring will evaluate weed management activities at project and field office levels.

MD-13: Provide information and educational material to the public.

MD-14: Mitigation measures will be applied on a case-by-case basis during activity level planning if review of the project indicates a potential to spread or introduce invasive species consistent with the management decisions and restrictions found in this section and the Guidelines and BMPs listed in **Appendix J**.

MD-15: Exceptions to weed and invasive species control restrictions will be allowed in cases where noxious weeds or other invasive species are rapidly spreading or invading and immediate action is needed for control provided the long-term impacts on the species being protected is minor. All herbicide, insecticide, and pesticide applications will be completed in accordance with label restrictions.

3.2.7 Invasive Terrestrial Animals and Insect Species

Goal 1: *Manage invasive terrestrial animal and insect species, and state and locally declared pests. Reduce acres and/or density of infestations by invasive species through prevention, early detection and rapid response, and provide education opportunities for public land users.*

Goal 2: *Infestations are not common across the landscape.*

Management Decisions

MD-1: Invasive terrestrial species, could be treated using IPM methods, as required by federal, state, and local laws, statutes and regulations, or if they are causing economic or environmental harm, or harm to human health.

MD-2: State or locally declared pests could be treated using IPM methods, if consultation reveals that serious, economic or environmental harm, or harm to human health, may occur.

MD-3: All treatments will be designed to decrease the presence of, or reduce the susceptibility of invasion/outbreaks of invasive pests while minimizing adverse impacts on non-target species.

MD-4: Grasshopper/Mormon Cricket outbreaks will be managed in cooperation with the United States Dept. of Agriculture's (USDA) Animal and Plant Health Inspection Service/Plant Protection and Quarantine (APHIS/PPQ).

MD-5: All insecticide and pesticide applications will be completed in accordance with label restrictions.

3.2.8 Invasive Aquatic Species

Goal 1: *Keep the aquatic environment free from invasive aquatic species. Prevent the introduction of invasive species into the aquatic environment through education of public land users on prevention, early detection, rapid response, control, management and restoration.*

Goal 2: *All lentic (lakeshore/wetland) and lotic (river/stream) areas remain free from invasive aquatic species.*

Management Decisions

MD-1: Invasive aquatic species could be treated using IPM methods, as required by federal, state, and local laws, statutes and regulations, or if they are causing or have the potential to cause economic or environmental harm, or harm to human health.

MD-2: Provide information and educational material to the public.

MD-3: Utilize IPM concepts while working within federal, state laws, statutes, and regulations to minimize infestations of invasive aquatic species.

MD-4: BMPs will be included in all new treatment projects, and incorporated, where possible, into existing contracts, agreements, and land use authorizations that will potentially result in the introduction or spread of invasive aquatic species.

MD-5: All herbicide, insecticide, and pesticide applications will be completed in accordance with label restrictions.

3.2.9 Wildlife

Goal 1: *Ensure that native wildlife species are provided habitat of sufficient quality and quantity to enhance biological diversity and sustain their economic, social and ecological values.*

Goal 2: *Provide habitat and forage to support wildlife with consideration of South Dakota Wildlife Action Plan game management goals and the Northern Great Plains Joint Venture Program.*

Goal 3: *Improve the resilience of wildlife habitats to protect wildlife communities from stressors and events such as severe wildfire and climate change*

Goal 4: *Movement of big game species between habitats will be facilitated.*

Goal 5: *Ensure that a full spectrum of biological communities' habitats and their ecological processes are present.*

Goal 6: *Ensure that populations of native plants and animals are well distributed across the landscape.*

Goal 7: *Provide suitable habitat condition to allow for movement between blocks of habitat and seasonal and specialized habitats on a local and landscape scale.*

Goal 8: *Maintain or improve specialized habitats on a local and landscape scale.*

Management Decisions

MD-1: Any mechanical and vegetation treatments within big sagebrush habitat crucial to sagebrush obligate species will be evaluated at the project level by an interdisciplinary team to protect that resource.

MD-2: Surface-disturbing and disruptive activities within 2 miles of the perimeter of sharp-tailed grouse leks will be subject to a plan approved by BLM that provides adequate mitigation measures and conservation actions to protect breeding, nesting, and brood-rearing habitats and limit disturbance in a manner that will support the long-term populations associated with the lek and surrounding habitat.

O&G - CSU: Oil and gas leasing within 2 miles of a lek will be subject to a plan approved by BLM that provides adequate mitigation measures and conservation actions to protect breeding, nesting, and brood-rearing habitats and limit disturbance in a manner that will support the long-term populations associated with the lek and surrounding habitat. WEMs are described in **Appendix G**.

MD-3: A TL Decision was considered to be unnecessary because of the stipulation provided in MD-2.

MD-4: Public lands within 2 miles of sharp-tailed grouse and greater prairie-chicken leks will be an avoidance area for all types of ROWs including renewable energy ROWs.

MD-5: Surface-disturbing and disruptive activities: Structures over 10 feet that create raptor perches will not be authorized or will require anti-perch devices within the 2 mile buffer of sharp-tailed grouse and greater prairie-chicken leks to protect nesting habitat.

O&G – CSU: Structures that are over 10 feet in height that create raptor perches will not be authorized or will require anti-perch devices within the 2 mile buffer of sharp-tailed grouse and greater prairie-chicken leks.

MD-6: New power lines will be sited and designed in a manner which does not impact sharp-tailed grouse or greater prairie-chickens within a 2 mile buffer of leks.

O&G - CSU: Power lines must be buried, designed or sited in a manner which does not impact sharp-tailed grouse or greater prairie-chickens within a 2 mile buffer of leks.

MD-7: Surface disturbing and disruptive activities within big game winter range will be subject to a plan approved by BLM that provides adequate mitigation measures and conservation actions to protect habitat and limit disturbance in a manner that will support the long-term populations associated with the winter range.

O&G – CSU: Prior to surface occupancy and use a plan shall be prepared by the proponent as a component of the APD, Sundry Notice, etc. and approved by the AO with confirmation from the state wildlife management agency. The operator shall not initiate surface-disturbing activities unless the AO

has approved the plan. The plan must demonstrate to the AO's satisfaction the function and suitability of the habitat will not be impaired. WEMs are described in **Appendix G**.

MD-8: Big game winter range will be an avoidance area for commercial renewable energy development and other ROWs.

MD-9: Surface disturbing and disruptive activities will not be allowed within ¼ mile of raptor nest sites active within the preceding 7 years unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated, relevant conservation actions or needed design features are included and the goals of this plan not compromised.

O&G – NSO: Surface occupancy and use is prohibited within ¼ mile of raptor nest sites active within the preceding 7 years.

MD-10: Surface disturbing and disruptive activities will be avoided within ½ mile of active raptor nests from March 1 through July 31.

O&G – TL: Surface use is prohibited within ½ mile of active raptor nest sites from March 1 through July 31.

MD-11: Areas within ¼ mile of raptor nests active within the preceding 7 years will be an exclusion area for renewable energy ROWs and an avoidance areas for other types of ROWs.

MD-12: One quarter mile weed treatment restriction zone around current year active raptor nesting site from March 1-August 1.

MD-13: Snag and cavity bearing tree cutting, removal, and offer for sale or utilization will be allowed for public safety, salvage post fire, and/or in response to other resource needs.

MD-14: Limit activities that will destroy or degrade traditional high value roost sites for wild turkeys. Retain 10 inch or larger diameter at breast height trees in groups of 3 to 6 that have roost tree characteristics on slopes and ridges to provide roost sites for turkeys within ponderosa pine habitat.

MD-15: Changes in livestock conversions from cattle to domestic sheep or goats will not be allowed in allotments within current or SDGFP proposed bighorn sheep range. Transfer of grazing preference will only be allowed to livestock types other than domestic sheep and goats within occupied or proposed bighorn sheep range.

New domestic sheep and goat allotments or conversions from cattle to domestic sheep or goats will be permitted a minimum of 15 miles from known bighorn sheep range. This distance (buffer) will be greater if deemed necessary through site-specific analysis and additional research findings.

To minimize contact with bighorn sheep, domestic sheep and goats used for weed control within 10 miles of bighorn sheep range will only occur with coordination with SDGFP.

MD-16: Surface disturbing and disruptive activities will be allowed in occupied or SDGFP proposed bighorn sheep habitat provided any adverse impacts on bighorn sheep can be adequately mitigated,

relevant conservation actions or needed design features are included and the goals of this plan and the SDGFP bighorn sheep plan (2007) are not compromised.

O&G – NSO: Surface occupancy and use will not be allowed in occupied or SDGFP proposed bighorn sheep range.

MD-17: Occupied or SDGFP proposed bighorn sheep range will be a ROW avoidance area for renewable energy and other types of ROWs.

MD-18: Any Conversion of vegetation type from tame pasture to native vegetation or from native vegetation to tame pasture (introduced species) will be allowed when needed to protect, maintain or improve wildlife habitat, sensitive soils, riparian vegetation and control weeds/invasive species.

Vegetation type conversion proposals will be evaluated at the project level to protect wildlife habitat and watershed resources (e.g., sagebrush habitat important to sagebrush obligate species). No more than one percent of BLM administered public land in the planning area will be converted from native species to introduced species.

MD-19: Priority for funding and implementing range improvements will be given to improve multiple resources.

MD-20: Surface disturbing and disruptive activities will not be allowed within ¼ mile of colonial nesting water bird colonies unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated, relevant conservation actions or needed design features are included and the goals of this plan not compromised.

O&G – NSO: Surface occupancy and use is prohibited within ¼ mile of water bird nesting colonies.

MD-21: Surface disturbing and disruptive activities will not be allowed within ½ mile of colonial nesting water bird colonies from April 1 through July 15 unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated, relevant conservation actions or needed design features are included and the goals of this plan not compromised.

O&G – TL: Surface disturbing and disruptive activities will be prohibited within ½ mile of water bird nesting colonies from April 1 through July 15.

MD-22: Areas within ½ mile of colonial water bird nesting colonies will be exclusion areas for Renewable Energy ROWs.

ROWs - Areas within ½ mile of colonial water bird nesting colonies will be avoidance areas for other types of ROWs.

MD-23: New fences will follow BLM specifications (BLM Handbook 1741-1 and Washington Office (WO)-IM-2010-022) to allow for wildlife passage and located or marked as feasible to minimize collisions and other wildlife issues, except for fences built specifically to keep wildlife out of an area.

MD-24: Existing fences will be reviewed to identify areas where fence modification or removal could be implemented to improve wildlife movement problems.

MD-25: BMPs (**Appendix J**) including oil and gas BMPs for wildlife will be used to reduce impacts on wildlife.

MD-26: Functional wildlife escape ramps will be installed and maintained on all water tanks on BLM lands.

MD-27: SDGFP Bat Management Plan (2004) will be implemented and mine openings inventoried for bat use prior to closing with public safety in mind.

MD-28: Retain a minimum of two existing snags greater than 16 in diameter at breast height (DBH) and 30 ft. tall per acre, unless a safety hazard exists. Salvage or felling of dead or dying trees will be acceptable.

MD-29: Coordinate with other federal, state and private land management agencies in developing a habitat management plan.

MD-30: BLM authorized activities will actively manage for multiple ecosystems and a variety of habitat conditions for non-game mammals, migratory, and grassland birds.

MD-31: Follow current “Reducing Avian Collisions with Power Lines” (APLIC 2012) for all land use authorizations (summarized in **Appendix J**).

MD-32: Existing power lines identified for electrocution problems for wildlife on public lands will be modified to prevent wildlife electrocution.

MD-33: Fuels treatments will be designed to protect and/or improve wildlife habitat.

MD-34: Manage water developments to reduce the spread of West Nile virus through type, design, and siting of water developments (refer to **Appendix C** and **F**).

MD-35: Predator control will be permitted subject to the stipulations outlined in the annual Animal Damage Control MOU between BLM and USDA-APHIS

MD-36: Identify distribution, key habitat areas, and special management needs for development of management plans and conservation measures with emphasis on riparian/wetland areas, cottonwood galleries, native grasslands, sagebrush steppe, woody draws and seasonal ranges supporting life cycle requirements for wildlife.

MD-37: Mitigation of activities including surface-disturbing or disruptive activities will be applied where needed to avoid, minimize, rectify, reduce or compensate for impacts of human activities to wildlife or wildlife habitat consistent with the management decisions and restrictions found in this section and the Guidelines and BMPs listed in **Appendix J**. Mitigation measures will be applied on a case-by-case basis during activity level planning if review of the project area indicates wildlife will be affected. Exceptions to stipulation requirements may be granted by the AO if an environmental review demonstrates that effects could be mitigated to an acceptable level. Exceptions may also be granted where the short-term effects are mitigated by the long-term benefits (e.g., riparian restoration projects, prescribed fire, or vegetation treatments).

The sequence of mitigation action will be:

Step 1. Avoid - Adverse impacts on resources are to be avoided and no action shall be permitted if there is a practicable alternative with less adverse impact.

Step 2. Minimize - If impacts on resources cannot be avoided, appropriate and practicable steps to minimize adverse impacts must be taken.

Step 3. Compensate - Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain. The amount and quality of compensatory mitigation may not substitute for avoiding and minimizing impacts.

3.2.10 Special Status Species

Goal 1: *Ensure the long-term and self-sustaining persistence of special status species in South Dakota.*

Goal 2: *Protect/maintain populations of special status species by minimizing direct mortality and impacts on habitat.*

Goal 3: *Provide suitable habitat condition to allow for movement between large blocks of habitat and seasonal and specialized habitats on a local and landscape scale.*

Goal 4: *Maintain or improve specialized habitats on a local and landscape scale.*

Goal 5: *Maintain and/or increase sage-grouse abundance and distribution by conserving, enhancing or restoring the sagebrush ecosystem upon which populations depend in cooperation with other conservation partners.*

Goal 6: *Refer to Section 2 GRSG goals in Section 2.*

Goal 7: *Manage for the biological integrity and habitat suitability to facilitate the conservation, recovery, and maintenance of populations of plants, fish and wildlife to avoid contributing to the listing of or jeopardizing the continued existence or recovery of special status species and their habitats.*

Goal 8: *Maintain or enhance areas of ecological importance for special status wildlife species.*

Goal 9: *Conserve and recover special status wildlife species by determining and implementing conservation strategies including restoration opportunities, use restrictions, and management decisions.*

Goal 10: *Manage specific environmental hazards, risks, and impacts in a manner compatible with special status wildlife species health.*

Goal 11: *Identify habitat thresholds necessary to sustain well-distributed healthy populations of special status species to avoid future listings under the ESA.*

Goal 12: *Develop and implement the BMPs, activity plans, or use other mechanisms to protect high priority special status wildlife species.*

Goal 13: *Manage special status species in consideration of the working landscape and the intermingled land ownership pattern that is present.*

Goal 14: Across the planning area, maintain sagebrush cover at levels at or near the full potential for the each ecological site.

Goal 15: Refer to Section 2 GRSG goals section in Section 2.

Goal 16: In all PHMA, the desired condition is to maintain all lands ecologically capable of producing sagebrush (but no less than 70%) with a minimum of 15% sagebrush canopy or as consistent with specific ecological site conditions. The attributes necessary to sustain these habitats are described in *Interpreting Indicators of Rangeland Health* (BLM Tech Ref 1734-6).

Management Decisions

Refer to **Section 2** for Management Decision for GRSG.

MD-1 Special Status Raptors: Surface disturbing and disruptive activities will not be allowed within ½ mile of known bald eagles nests active within the preceding 5 breeding seasons unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated, relevant conservation actions or needed design features are included and the goals of this plan not compromised.

O&G – NSO: Surface occupancy and use is prohibited within ½ mile of bald eagle nest sites active within the preceding 5 years. WEMs are described in **Appendix G**.

MD-2 Bald Eagles: Renewable Energy ROWs: Public lands within ½ mile of bald eagle nests will be an exclusion area.

Other types of ROWs: Public lands within ½ mile of bald eagle nests will be an avoidance area.

MD-3 Bald and Golden Eagles: No weed treatments from 3/1- 8/1 within a ¼ mile buffer zone around active bald and golden eagle nesting sites. Exceptions to treatment restrictions may be allowed to address aggressively spreading weeds or invasive plants (MT Category I weeds) that require aggressive and timely treatment during this period following consultation with necessary specialists to minimize impacts on eagles.

MD-4 Peregrine Falcons: Surface disturbing and disruptive activities will not be allowed within 1 mile of identified peregrine falcon nesting sites active within the preceding 7 breeding seasons unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated, relevant conservation actions or needed design features are included and the goals of this plan not compromised. Other surface occupancy and permitted uses could be limited at the project level.

O&G – NSO: NSO or use within 1 mile of peregrine nesting sites active within the preceding 7 breeding seasons. WEMs are described in **Appendix G**.

MD-5 Peregrine Falcons: Renewable Energy ROWs: Public lands within ½ mile of peregrine falcon nests will be an exclusion area. Other types of ROWs: Public lands within ½ mile of peregrine falcon nests will be an avoidance area.

MD-6 Special Status Raptors: Surface disturbing and disruptive activities will be avoided within ¼ mile of sensitive and special status raptor nest sites that were active within the last 7 years (eagles and peregrine falcons are addressed separately).

O&G – NSO: NSO or use within ¼ mile of special status raptor nests.

MD-7 Special Status Raptors: Surface disturbing and disruptive activities will be avoided within ½ mile of active special status raptor nests from March 1 through July 31. Peregrine falcons and bald eagle will be addressed separately.

O&G – TL: Surface use is prohibited within ½ mile of active raptor nest sites from March 1 through July 31

MD-8 Special Status Raptors: Renewable Energy ROWs: Areas within ¼ miles of nest of special status raptors active within the preceding 7 years will be an exclusion area. Other types of ROWs: Areas within ¼ miles of nest of special status raptors active within the preceding 7 years will be an avoidance area.

MD-9 Special Status Raptors: One quarter mile weed treatment restriction zone around current year active raptor nests from March 1-July 31. Exceptions to treatment types and dates of treatments may be allowed to address aggressively spreading weeds or invasive plants (MT Category I weeds) that require aggressive and timely treatment during this period following consultation with necessary specialists to minimize impacts.

*Management Decisions (10-33) for GRSG are located in **Section 2**.*

MD-33 Grassland and migratory birds: Prescribed burning will be allowed to achieve measurable landscape level objectives from:

- other resources, including, but not limited to forestry, wildlife, range, vegetation, and watershed - the reduction of hazardous fuels (public safety)
- the introduction of fire into fire adapted ecosystems

Prescribed fire may be allowed in Greater Sage-Grouse PHMA and general habitat if it is done solely for the purposes of improving or maintaining sage-grouse habitat.

MD-34 Piping Plover: Surface disturbing and disruptive activities will not be allowed within ¼ miles of wetlands identified as piping plover habitat unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated, relevant conservation actions or needed design features are included and the goals of this plan not compromised.

O&G - NSO: Surface occupancy and use will be prohibited within ¼ mile of piping plover habitat. WEMs are described in **Appendix G**.

MD-35 Piping Plover: Public lands within ¼ mile of wetlands or associated habitats identified as piping plover habitat will be an exclusion area for renewable energy development and other ROWs.

MD-36 Least Tern: Surface disturbing and disruptive activities will not be allowed within ¼ mile of wetlands identified as interior least tern habitat unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated, relevant conservation actions or needed design features are included and the goals of this plan not compromised.

O&G - NSO: Surface occupancy and use will be prohibited with ¼ miles of interior least tern habitat. WEMs are described in **Appendix G**.

MD-37 Least Tern: Public lands within ¼ mile of wetlands or associated habitats identified as least tern habitat will be an exclusion area for commercial renewable energy development and other ROWs.

MD-38 Sprague's Pipit: Surface disturbing and disruptive activities will not be allowed in moderate to high potential Sprague's Pipit habitat from April 15 to July 15 unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated, relevant conservation actions or needed design features are included and the goals of this plan not compromised.

O&G - A lease notice will be attached to all leases in documented or potential habitat for Sprague's Pipit. The lease notice will notify the lease holder that mitigation and conservation actions may be required including a limit on exploration and development from April 15 to July 15.

MD-39 Sprague's Pipit: Moderate to high potential habitat for Sprague's Pipit will be ROWs avoidance areas for all types of ROWs.

MD-40 Prairie dogs: Prairie dog colonies that occur entirely on public land will be managed for their wildlife, recreational and other values. Treatment will only be considered if they are determined to be adversely impacting resources on public land or causing threats to public safety.

MD-41 Prairie dogs: Treatment of any prairie dog colony that exists on both public and private land will be considered through project level planning when the adjoining landowner is controlling the prairie dogs on their land.

MD-42 Prairie dogs: Prairie dogs could be considered for reintroduction on historic colonies or large unfragmented blocks of public and cooperating adjoining land owners with a minimum of 10,000 or more acres of public land, if acquired, with a 1 mile buffer from adjoining private land, and while considering other resources and uses.

MD-43 Prairie dogs: Surface-disturbing and disruptive activities will be allowed within prairie dog colonies provided that adequate mitigation and conservation actions are developed to maintain the functionality of the prairie dog habitat.

O&G – CSU: Oil and gas leasing will be open and surface occupancy and use on prairie dog colonies will be allowed provided adequate mitigation and conservation actions are implemented to maintain the functionality of the prairie dog habitat. WEMs are described in **Appendix G**.

MD-44 Prairie dogs: Prairie dog colonies will be ROWs avoidance areas.

MD-45 Prairie dogs: BLM may limit treatment of prairie dogs as needed to protect overall prairie dog populations or other resources.

MD-46 Black-footed ferret: Surface disturbing and disruptive activities will not be allowed in occupied black-footed ferret habitat. Currently suitable habitat is not present on BLM public lands in the planning area. However, potential habitat does exist and may be occupied in the future.

O&G - NSO: Surface occupancy and use will be prohibited within 1/4 mile of occupied black-footed ferret habitat. WEMs are described in **Appendix G**.

MD-47 Black-footed ferret: Occupied black-footed ferret habitat will be a ROW exclusion area.

MD-48 Bats: Bat gates or other suitable measures will be used to protect bats and bat habitat unless public health and safety would be sacrificed.

MD-49: Surface disturbing and disruptive activities will be avoided within 1/4 mile of the water's edge of the Missouri River to protect pallid and shovel-nosed sturgeon.

O&G – NSO: Surface occupancy and use is prohibited within 1/4 mile of the water's edge of the Missouri River to protect pallid and shovel-nosed sturgeon. WEMs are described in **Appendix G**.

MD-50 Pallid and Shovel Nosed Sturgeon: Areas within 1/4 miles of the water's edge of the Missouri River will be ROW avoidance areas. to protect pallid and shovel-nosed sturgeon.

MD-51 Special Status Plants: Livestock grazing in areas with high concentration of special status plants will not be allowed unless no adverse impacts would occur as determined through site-specific review by interdisciplinary team.

MD-52 American Dipper: Evaluate all actions along Whitewood Creek and limit any actions that could decrease water flows and quality to maintain American dipper habitat.

MD-53 Habitat: Special Status Species and their habitat will be given special consideration before any actions are taken.

MD-53 Use of BMPs and Guidelines: BMPs and Guidelines including Oil and Gas BMPs for Wildlife will be used to reduce impacts on Special Status Species.

MD-54 Inventory: Inventory potential habitat used by BLM special status species.

MD-55 Unoccupied habitat: If unoccupied habitat for special status species exists, BLM will work with other agencies, stakeholders, and partners to analyze proposals to reintroduce species while considering other resources and uses.

MD-56 Mitigation for GRSG: The mitigation and conservation measures for sage-grouse (**Appendix F**) will be used to mitigate impacts from surface disturbance and disruptive activities in priority and general sage-grouse habitat in order to meet the goals and objectives set forth in this ARMP and the BLM National Sage-grouse Conservation Strategy.

MD-57 Fences in GRSG habitat: New fences will be located to avoid sage-grouse leks and winter range and/or marked if these areas cannot be avoided.

MD-58 West Nile virus in GRSg habitat: Manage water developments to reduce the spread of West Nile virus within sage-grouse habitat areas (especially for those water impoundments where water levels are artificially maintained).

MD-59 Fence hazards and GRSg: Install reflectors on fences for sage-grouse where appropriate.

MD-60 Water development and West Nile virus: Manage water developments to reduce the spread of West Nile virus within sage-grouse habitat areas.

MD-61 Avian collisions with power lines: Follow current “Reducing Avian Collisions with Power Lines” (APLIC 2012) for all land use authorizations.

MD-62 Hazards from overhead lines: Existing overhead lines that are determined to be a major hazard to wildlife will be modified to reduce or eliminate the hazard.

MD-63 Prairie dog control: Prairie dog control will consider impacts on wildlife species associated with prairie dog colonies.

MD-64 Movement and genetic diversity of GRSg: Within sage-grouse habitat, BLM will maintain habitat for sage-grouse subpopulations to promote movement and genetic diversity. Maintain, restore or enhance sage-grouse habitat and connectivity between sagebrush habitats, with emphasis on those habitats occupied by sage-grouse.

MD-65 Habitat restoration for GRSg: Within sage-grouse habitat, BLM will evaluate areas for habitat restoration or enhancement potential. Specific restoration or enhancement actions will be determined at the project (implementation) level.

MD-66 Special Status Species Habitat: Where suitable conservation actions cannot be achieved, seek to acquire state and private lands with intact subsurface mineral estate by donation, purchase or exchange in order to best conserve, enhance or restore sage-grouse habitat.

MD-67 Recovery plans: The ARMP incorporates existing recovery plans, management strategies, and guidelines for federally listed T&E species. State management plans will be considered for delisted species.

MD-68 Mitigation for GRSg: When mitigation for sage-grouse is necessary, BLM will prioritize mitigation in priority sage-grouse habitat areas (dependent upon the area-specific ability to increase sage-grouse populations; **Appendix F**).

MD-69 Migratory birds: To insure compliance with the Migratory Bird Treaty Act, surface disturbing and disruptive activities will be avoided from April 15 to July 15 and a Migratory Bird Treaty Act lease notice attached to all new leases (Refer to **Appendix G**).

MD-70 Mitigation: Mitigation of activities including surface-disturbing or disruptive activities will be applied where needed to avoid, minimize, rectify, reduce or compensate for the impacts of human activities to special status species or special status species habitat consistent with the management actions and restrictions found in this section and the Guidelines and BMPs listed in **Appendix J** of the South Dakota ARMP. Mitigation measures will be applied on a case-by-case basis during activity level

planning if review of the project area indicates special status species are present or would be affected. Exceptions to stipulation requirements may be granted by the AO if an environmental review demonstrates that effects could be mitigated to an acceptable level. Exceptions may also be granted where the short-term effects are mitigated by the long-term benefits (e.g., riparian restoration projects, prescribed fire, or vegetation treatments).

The sequence of mitigation action will be:

Step 1. Avoid - Adverse impacts on resources are to be avoided and no action shall be permitted if there is a practicable alternative with less adverse impact.

Step 2. Minimize - If impacts on resources cannot be avoided, appropriate and practicable steps to minimize adverse impacts must be taken.

Step 3. Compensate - Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain. The amount and quality of compensatory mitigation may not substitute for avoiding and minimizing impacts.

3.2.11 Fish and Aquatics

Goal 1: *Ensure that aquatic habitat is of suitable quality to support a diversity of plant and animal communities.*

Goal 2: *Promote public awareness, appreciation, and fisheries conservation, management and ecology.*

Management Decisions

MD-1: Increase fishing opportunities by development of ponds or reservoirs dependent upon water availability and dam constraints.

MD-2: Maintain aquatic habitat and fishing opportunities. Periodic stocking will be allowed by SDGFP or BLM.

MD-3: The fisheries habitat in Bear Butte and Whitewood Creek will be improved where feasible.

MD-4: Surface disturbing and disruptive activities will be avoided within ¼ mile of reservoirs with sport fisheries.

O&G – NSO: Surface occupancy and use will be prohibited within ¼ mile of designated reservoirs with fisheries. WEMs are described in **Appendix G**.

MD-5: Public lands within ¼ mile of reservoirs with sport fisheries will be an avoidance area for renewable energy development and other ROWs except that proposals will be considered for implementing individual ROW linear crossings if no other feasible crossing location can be found. If BLM allows a ROW crossing of the avoidance area, off site mitigation may be required.

MD-6: Additional water sources and opportunities to maintain or increase water levels will be developed to benefit wildlife, fisheries, other aquatic species and livestock.

MD-7: Evaluate all projects for aquatic habitat potential.

MD-8: Aquatic stream/river surveys and monitoring will occur to collect baseline and trend data to evaluate the existing condition. This information is needed for determining the effects from other management on aquatic resources, mitigation and protection measures and identifying habitat restoration needs.

MD-9: Survey and monitoring will include (1) fish (2) Macro-invertebrates (3) water quality (4) instream habitat (5) riparian habitat.

MD-10: Fishing reservoirs will be surveyed/monitored as needed for fish, riparian, emergent vegetation, reservoir condition, water quality, water depth, and condition of access.

MD-11: BLM roads/trail crossings and ROW on fish bearing streams will be made fish and aquatic species passable.

MD-12: All fishing reservoirs will be maintained as a fishery as long as BLM and SDGFP determine that it is a viable fishery.

MD-13: Coordinate with SDGFP, other agencies and general public on the educational public fishing days and other aquatic educational opportunities.

MD-14: Develop habitat structures in reservoirs that are lacking structure or need restoration for aquatic species.

MD-15: Coordinate with SDGFP prior to fisheries improvements.

MD-16: Utilize IPM concepts while working within federal, state laws, statutes, and regulations to minimize infestations of invasive aquatic species.

3.2.12 Cultural Resources

Refer to the Special Designation Section for additional Goals and Management Decisions for ACECs.

Goal 1: *Identify, preserve, and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations.*

Goal 2: *Seek to reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration or potential conflict with other resource uses by identifying priority geographic areas for new field inventory, based on a probability for unrecorded significant resources.*

Management Decisions

MD-1: Conduct up to 400 acres of Section 110 cultural inventories per year.

MD-2: Bear Butte National Historic Landmark (NHL) (410 Acres federal minerals) will be recommended for withdrawal, while leasable federal minerals and salable federal minerals will be closed (no lease).

MD-3: Standard lease conditions (**Appendix G**) will protect areas within and around cultural sites, Native American traditional use areas/Traditional Cultural Properties (TCP), and

Archaeological/Historic Districts that are eligible or potentially eligible for the National Register of Historic Places (NRHP).

Protective buffers include:

Surface-disturbing activities will not be allowed within and for a distance of 300 feet from the boundaries of cultural properties and archaeological/historic districts determined to be eligible or potentially eligible for the NRHP.

O&G – NSO: Surface-disturbing activities will not be allowed within and for a distance of 300 feet from the boundaries of cultural properties and archaeological/historic districts determined to be eligible or potentially eligible for the NRHP. Standard lease conditions will not allow Surface Occupancy and Use within, and for a distance of ½ mile from the boundaries of cultural properties determined to be of importance to Native American Tribal groups, sites determined to be TCPs, and/or designated for traditional use. Such properties include (but are not limited to) burial locations, pictograph/petroglyph, vision quest locations, certain stone alignments, buttes or other uplift type landforms, plant gathering locations, and areas considered sacred or used for religious purposes.

MD-4: The BHAD will be closed to oil and gas leasing due to public safety concerns (see Hazardous Materials section). The abandoned town site of Igloo and adjacent NRHP Eligible Historic Property lands will have NSO restrictions. WEMs are described in **Appendix G**. The BHAD and Igloo town site will be closed to salable minerals, but open to locatable mineral development.

O&G – Closed: The BHAD will be closed to oil and gas leasing due to public safety concerns. NSO: The abandoned town site of Igloo and adjacent NRHP Eligible Historic Property lands will have NSO restrictions.

MD-5: Surface disturbing and disruptive activities will be avoided within 1/2 mile of National Historic Trails unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated through design features or other means and the goals of this plan not compromised.

O&G – NSO: A NSO and use stipulation will apply within 1/2 mile of National Historic Trails. WEMs are described in **Appendix G**.

In the case of the Lewis and Clark National Historic Trail, the NSO stipulation and limits on surface disturbing and disruptive activities will apply to the water bodies and those areas with ½ mile of the high water mark of the Missouri River and its reservoirs.

MD-6: Areas within ½ mile of National Scenic and Historic Trails (NSHT) will be an exclusion area for Renewable energy ROWs. Areas within ½ mile of NSHT will be an avoidance area for other types of ROWs: unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated through design features or other means and the goals of this plan are not compromised.

MD-7: BLM will inventory and evaluate cultural resources pursuant to Section 106 and Section 110 of the National Historic Preservation Act (NHPA) to consider the effects of proposed BLM actions on cultural properties which may be eligible for the NRHP including TCPs.

MD-8: Should National Register eligible cultural resources be found during an inventory, impacts on them will be mitigated, generally through avoidance. Should it be determined the cultural resources cannot be avoided; consultation with the SHPO will be initiated. A program on mitigation will be developed via consultation between the SDFO, the SHPO, the Tribal Historic Preservation Office (THPO), and the Advisory Council on Historic Preservation.

MD-9: The BLM will continue to consult with Native American Tribes to identify areas that are important to the tribes. Consultation may result in identifying areas for cultural resource field inventories.

MD-10: BLM will consult with Native American tribes to discuss view shed and the potential effects on TCPs.

MD-11: The BLM will limit surface-disturbing activities within selected Native American traditional cultural and religious sites for continued use by tribes. Traditional cultural sites will be identified in consultation with affiliated Native American tribes.

MD-12: BLM will evaluate cultural resources according to the National Register criteria (36 CFR, Part 60.4) and assign cultural resources to appropriate use categories (BLM Handbook 8110.41 and .42) as the basis for management decisions.

MD-13: All sites determined eligible to the NRHP will be allocated and managed for Scientific, Public, Traditional, Experimental, and/or Conservation for future use. If another use becomes evident or proposed after use allocation has occurred, the use allocation may be changed without a plan amendment.

MD-14: The BLM will conduct regular monitoring of at-risk cultural sites to protect sites from conflicts with other resources uses and to document natural and human caused deterioration.

MD-15: Where feasible, the BLM will acquire properties adjacent to public lands through donation, exchange, or purchase that contain significant cultural resources including, but not limited to, those properties eligible for inclusion on the NRHP.

MD-16: The BLM will continue management of Fort Meade according to the goals and objectives of the 1987 Cultural Resource Management Plan (CRMP) and the 1996 Fort Meade Recreation Area ACEC Management Plan. This includes Management Objectives such as: (1) Inventory and evaluate sites/features on public lands to determine their best use. (2) Protect significant sites/features and (3) Insure their proper use by allocating and managing cultural resource sites to Conservation, Scientific, Traditional, and /or Public Use. Interpretive sites will be developed as appropriate.

MD-17: For Oil and Gas Leasing, to ensure that leased lands are examined to determine if cultural resources are present and to specify protective mitigation measures, the BLM will restrict surface-disturbing activities by attaching a lease notice for Cultural Resource Survey and a Cultural Resource Lease Stipulation for avoidance and protection of cultural resources (**Appendix G**), to all oil and gas lease parcels sold.

MD-18: BLM will continue to attach the Cultural Resource Protection condition to all Range Grazing Leases (**Appendix P**).

MD-19: Allocate and manage all National Register eligible Rock Art sites for Conservation, Scientific, Traditional, and /or Public Use. Interpretative sites will be developed as appropriate.

MD-20: Allocate and manage all National Register eligible Aboriginal sites such as Occupation (camp sites), and Use Sites (quarries, game kills, lithic procurement sites) to Scientific, Traditional, and/or Conservation Use. Interpretative sites will not be developed.

MD-21: Allocate and manage all Prehistoric Earthworks sites (Aboriginal earthen mounds) to Conservation Use and Traditional Use. Interpretative sites will not be developed.

MD-22: Allocate and manage all National Register eligible Rock alignments, (effigy figures, drive-lines, cairns, stone circles) to Conservation Use, Scientific, and Traditional Use. Interpretative sites will not be developed.

MD-23: Allocate and manage all National Register eligible Historic Sites--non-mining, (homesteads, farmsteads, cabins, historic roads, trails, and rail roads) for scientific use and public use. Interpretative sites will be developed as appropriate.

MD-24: Allocate and manage all National Register eligible Historic Mining Complex sites to Public and Scientific Use. Interpretative site will be developed at the Belle Eldridge Mine Site, if public access can be obtained.

MD-25: Allocate and manage National Register eligible Homestake Gold Historic Powder House Structures and related Caretakers House Foundation to Public Use. Interpretive site(s) will be developed.

MD-26: Allocate and manage all Vision Quest Sites/Sacred Sites/TCPs/Ethnohistoric as well as burial sites to Conservation Use and Traditional Use.

MD-27: Allocate and manage site that have been determined Not Eligible for consideration to the NRHP, such as Prehistoric sites with low diversity and limited quantity (50 artifacts), isolated finds; low or limited complexity; and small size with exhausted potential after initial recordation, or have been destroyed. Historic sites that contain little or no scientific or historical value (isolated trash dumps and artifact scatters, isolated features such as mine prospects pits or claim markers, and structural remains with no integrity) to Experimental Use or Discharge from Use. Interpretive sites will not be developed.

MD-28: O&G: The following fluid Mineral lease notice will be used to protect cultural resources: This lease may be found to contain historic properties and/or resources protected under the NHPA, American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, EO 13007, or other statutes and EOs. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

MD-29: Cultural Resource Survey requirements include: An inventory of those portions of the leased lands subject to proposed disturbance may be required prior to any surface disturbance to determine if cultural resources are present and to identify needed mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator shall:

1. The lessee or operator shall engage the services of a cultural resource consultant acceptable to the Surface Management Agency (SMA) to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the standard minimum to cover possible site relocation which may result from environmental or other considerations. Requirements for inventory methods including the size of standard APD survey areas will be followed as described in *Inventory Requirements for Proposed Well Sites, APD's - Well Pad/Block Inventory* in IM MT2015-043, or subsequent updates to this IM. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.
2. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as data recovery and extensive recordation. Where impacts on cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited. The lessee or operator shall immediately bring to the attention of the SMA any cultural resources discovered as a result of approved operations under this lease, and shall not disturb such discoveries until directed to proceed by the SMA.

3.2.13 Paleontological Resources

Refer to the Special Designation Section for additional Goals and Management Decisions for ACECs.

Goal 1: *Preserve and enhance paleontological resources on public land.*

Goal 2: *Provide opportunities for scientific and recreational uses of paleontological resources within the planning area.*

Goal 3: *Significant paleontological resources will be identified and preserved for their scientific values.*

Goal 4: *Educational and recreational opportunities will be enhanced for the enjoyment of the public.*

Management Decisions

MD-1: Prior to approval of surface-disturbing activities, field surveys will be considered for all potential fossil yield classification (PFYC) Class 4 and 5 formations in accordance with BLM guidance. A sampling of Class 3 formations will be surveyed based on known or likely paleontological occurrences. See Map J in **Appendix A2**. On-site or spot-check monitoring requirements during disturbance activities will be determined based on results of the survey.

O&G - Lease Notice: Prior to approval of surface-disturbing activities, field surveys will be considered for all PFYC Class 4 and 5 formations in accordance with BLM guidance. A sampling of Class 3 formations will be surveyed based on known or likely paleontological occurrences. See Map J in

Appendix A2. On-site or spot-check monitoring requirements during disturbance activities will be determined based on results of the survey.

MD-2: Hobby collecting areas for common invertebrate and plant fossils will be designated when possible using only hand tools. Areas containing significant invertebrate or plant fossils will be identified and closed to hobby collecting if warranted. Other surface use authorizations will be assessed for adverse impacts on paleontological resources in these localities, and appropriate management restrictions applied.

MD-3: Retain public lands with significant paleontological values. Identify non-BLM parcels that contain significant paleontological values. Include these parcels in acquisition efforts prompted by other resources, as applicable.

MD-4: Significant fossil localities will be identified, recorded, protected, and retained in Federal ownership as much as possible.

MD-5: Projects will be designed to avoid disturbance to significant paleontological resources, or proper mitigation procedures applied if avoidance is not possible.

MD-6: The PFYC system will be developed and applied to afford proper mitigation actions for all surface-disturbing activities and land disposal actions. Surface occupancy and use is prohibited within designated paleontological sites/localities.

MD-7: BLM will cooperate with permitted institutions or parties to map and record fossil localities.

MD-8: The requirements of Public Law 111-11 Subtitle D - Paleontological Resources Preservation will be followed for all management practices.

MD-9: At the Fossil Cycad ACEC casual or commercial collection of invertebrate, vertebrate and plant fossil will not be allowed (refer to glossary for definition of casual collection).

MD-10: Scientific collection of invertebrate, vertebrate and plant fossils may be allowed on a case-by-case basis through a permit.

MD-11: Surface occupancy and use is prohibited within designated paleontological sites/localities and in significant paleontological sites regardless of designation, except in the Fossil Cycad ACEC, which is closed to leasing.

The Special Designations section provides additional direction about paleontological resource protection at Fort Meade and Fossil Cycad ACECs.

O&G - NSO: Surface occupancy and use is prohibited within designated paleontological sites/localities and in significant paleontological sites regardless of designation, except in the Fossil Cycad ACEC, which is closed to leasing.

The Special Designations section provides additional direction about paleontological resource protection at Fort Meade and Fossil Cycad ACECs.

3.2.14 Visual Resources Management (VRM)

Goal 1: *Public lands provide natural appearing landscapes for recreational opportunities.*

Management Decisions

MD-1: Designates Fossil Cycad ACEC as VRM Class II, retains Fort Meade Byway as VRM Class II; Class III designation is assigned to Fort Meade ACEC portions, and to the Exemption Area SRMA; Class IV includes Recreation Development Zones in Fort Meade ACEC and other planning area acres. Maps of these areas are shown in **Section 3, Figure 3-2** (Exemption Area), **Figure 3-3** (Fort Meade ACEC) and **Figure 3-4** (Fossil Cycad ACEC).

Visual Resource Management (VRM) Classification is:

**Table 3-1
VRM Classifications**

VRM Class	VRM Acres
I	0
II	1,544
III	10,367
IV	259,841
0 (No Designation)	0

MD-2: CSU - Semi-permanent or permanent facilities that are not specifically prohibited in VRM Class II areas may require special design including location, size, and camouflage painting to blend with the natural surroundings and meet the visual quality objectives for the area (applies to all activities; CSU for oil and gas).

Surface-disturbing activities in VRM Class III and IV may also require designs to reduce VRM impacts (applies to all activities; lease notice for oil and gas).

O&G – CSU: Semi-permanent or permanent facilities that are not specifically prohibited in VRM Class II areas may require special design including location, size, and camouflage painting to blend with the natural surroundings and meet the visual quality objectives for the area (applies to all activities).

Surface-disturbing activities in VRM Class III and IV may also require designs to reduce VRM impacts (applies to all activities; lease notice for oil and gas).

Exceptions: The field manager may allow temporary projects to exceed VRM standards in Class II-IV areas if the project will terminate within 2 years of initiation. Rehabilitation will begin at least by the end of the two year period. During the temporary project, the field manager may require phased mitigation to better conform with prescribed VRM.

MD-3: Surface occupancy and use will be prohibited in and within ½ mile buffer of Exemption Area SRMA. Surface occupancy and use will be prohibited within ½ mile buffer around Fort Meade SRMA/ACEC.

O&G - NSO: Surface occupancy and use will be prohibited in and within ½ mile of buffer of the Exemption Area SRMA. Surface occupancy and use will be prohibited within ½ mile buffer around the Fort Meade SRMA/ACEC. (Minerals will be withdrawn within the Fort Meade SRMA/ACEC.)

MD-4: Public lands will be excluded from commercial wind energy development and will be a ROW avoidance area for other types of ROWs in VRM Class I and II designations.

MD-5: All of the Exemption Area is VRM III.

MD-6: Provide appealing landscapes and enhance opportunities to enjoy attractive settings. Manage scenic values in accordance with the objectives established for VRM Classification as described in **Appendix F** of the Proposed South Dakota RMP and Final EIS (BLM 2015) and in coordination with other resource uses and values.

MD-7: Surface occupancy and use for energy development will be prohibited in Class I Visual Management designations.

MD-8: Where current development degrades potential inventory class and as opportunities arise, review options to improve visual inventory class.

MD-9: Require interim reclamation for surface disturbances that are not necessary for production and maintenance activities, to reduce visual contrasts.

3.2.15 Fire Management and Ecology

Goal 1: *Manage wildfire and fuels for the protection of public health, safety, property, and resource values, emphasizing firefighter and public safety as the single overriding priority.*

Goal 2: *Manage hazardous fuels in areas of urban and industrial interface to reduce potential loss due to severe wildfire.*

Goal 3: *Maintain and/or improve desired mix of seral stages within vegetation communities including forest and woodlands, grasslands, shrublands, and riparian/wetlands.*

Goal 4: *Manage vegetation communities through cooperative efforts by restoring and maintaining natural fire regimes and frequency to the landscape, where appropriate.*

Goal 5: *Maintain and promote partnerships with the public and interagency cooperators to develop and strengthen coordination of all fire management activities across jurisdictional boundaries.*

Goal 6: *Utilize integrated management techniques unless otherwise restricted (defined as prescribed fire, mechanical, chemical, or biological, followed by desired seeding) to reduce fuels and to protect high priority areas or resource values.*

Goal 7: *Burned areas pose minimal threat to public safety, property, cultural resources, and/or ecological function.*

Goal 8: Continued ecological improvements in the conifer, grassland, shrubland, and riparian strata. This is reflected in moving Fire Regime Condition Class (FRCC) 3 to 2, Class 2 to 1, and maintaining Class 1; with emphasis in wildland urban interface (WUI) areas.

Management Actions

MD-1: Use and movement of heavy equipment (earth moving/tillage equipment) for fire suppression will be allowed in all areas unless otherwise restricted (ex: known archeological sites, hazardous and environmentally sensitive sites, ACECs). Precautions will be applied to protect cultural resources and values, archeological districts, reduce impacts on sensitive soils and plants, and to minimize soil erosion.

In areas where heavy equipment is restricted, Cultural Resource Specialists or Resource Advisors will be consulted for locations of identified areas before use of or anticipated use of heavy equipment.

Heavy equipment will be allowed off roads and trails except where prohibited.

Prescribed burning will be allowed to achieve measurable landscape level objectives from:

- other resources, including, but not limited to forestry, wildlife, range, vegetation, and watershed - the reduction of hazardous fuels (public safety);
- the introduction of fire into fire adapted ecosystems.

MD-2: Prescribed fire may be allowed in Greater Sage-Grouse PHMA and GHMA, provided it is done to benefit sage-grouse and the burn is consistent with BMPs, guidelines and sage-grouse mitigation and conservation actions as described in **Appendix C, J, and F**. The burn plan in GHMA or PHMA will clearly indicate how COT objectives will be addressed and met by its use, and why alternative techniques were not selected.

A Fire Risk Assessment will be completed for implementation of prescribed fire in relation to the GRSG goals and objectives.

MD-3: Areas identified for prescribed burning could be rested from livestock grazing up to one year prior to treatment if necessary to produce fine fuels to carry the burn, and for a minimum of one growing season following treatment to promote recovery of vegetation.

Adaptive Management: Prescribed livestock grazing following fire may be implemented prior to the minimum rest period.

Threshold: When an interdisciplinary team has determined that plant communities would move away from those plant communities that support the integrity of the ecological processes (water, energy, and nutrient cycles) without prescribed livestock grazing, prescribed livestock grazing will be used for special management purposes such as reducing annual plant invasion where site-specific interdisciplinary planning and the NEPA process has determined it to be a viable management option.

MD-4: All 274,345 acres of BLM-administered lands including the Exemption Area, Fort Meade ACEC, and remainder of South Dakota Fire Management Units will be designated as Category B – where fire may be desirable for resource benefit, but wildfire would cause negative impacts because of

developments and sensitive resources. Suppression is required in these areas. Prescribed fire and mechanical treatments will be used to reduce hazardous fuels and to enhance resources.

MD-5: Consistent with the ARMP, National Fire Suppression Guidelines and the current Fire Management Plan will be utilized to guide fire suppression techniques on public lands.

MD-6: In the course of fire suppression, a resource advisor will be consulted or assigned to wildfires that involve or threaten public lands.

MD-7: State of South Dakota Division of Wildland Fire will provide suppression responsibilities for wildfires on BLM-administered lands in cooperation with local rural and volunteer fire departments through Interagency Cooperative Agreements and approved Annual Operating Plans. At the present time, the Eastern Montana/Dakotas District Office in Miles City provides suppression resources and management for BLM lands and Custer-Gallatin National Forest lands within Harding County in northwestern South Dakota, which is in the Northern Rockies Geographical Area.

MD-8: The aerial application of fire retardant will be restricted over areas that contain petroglyphs and pictographs.

MD-9: BLM will follow the most recent policy for delivery of wildfire chemicals near waterways.

MD-10: Incident base camps, staging areas, helibases, and other incident management activities will be placed outside of and sufficiently distant from known or identified cultural resources and riparian areas.

MD-11: Priority of fire management activities will be placed on fuels reduction in WUI areas in conjunction with completed Community Wildfire Protection Plans (CWPPs).

MD-12: Fire management activities outside of WUI areas will use FRCC to determine level of fuels treatment.

MD-13: Treatments will be designed to protect and/or improve wildlife habitat and reduce the severity of wildfires.

MD-14: BLM will protect special status species habitat during suppression and prescribed fire activities as described in the National Fire Suppression Guidelines and the current fire management plan.

MD-15: BLM will provide assistance to communities in developing, implementing, and maintaining CWPPs.

MD-16: Treat burned areas that pose an unacceptable risk to public safety, property, cultural resources, and/or ecological function. Treatments will be in accordance with the National BLM Emergency Stabilization and Burned Area Rehabilitation policy.

MD-17: Mitigation measures will be applied on a case-by-case basis during activity level planning consistent with the management decisions and restrictions found in this section and the Guidelines and BMPs listed in **Appendix J**.

MD-18: In PHMA and within 3 miles of leks in GHMA will use aggressive suppression techniques and heavy equipment only when lesser techniques would not adequately protect habitat.

3.2.16 Forest and Woodland Products

Refer to the Special Designation Section for additional Goals and Management Decisions for ACECs.

Goal 1: *Manage public forest and woodlands to provide plant communities that support the integrity of the ecological processes (water cycle, energy cycle, and nutrient cycle) and improve or maintain wildlife habitat considering economically efficient methods.*

Goal 2:

- *Forests and woodlands support diverse vegetative communities as indicated by wildlife habitat goals.*
- *Forests and woodlands will be managed for ecological resiliency, as indicated by fuels and fire management goals.*
- *Forest and woodland treatments may result in vegetative products being available for public or other use depending on local market demands*

Goal 3: *Manage forest resources to improve resilience to severe events and maintain and enhance their ability for the long-term sequestration of carbon.*

Management Decisions

MD-1: All lands will be available for the sale, use, and treatment of forest and woodland products, except sale will not be allowed on the Fossil Cycad ACEC.

MD-2: Forest and woodland products, such as firewood, posts, poles, biomass, timber, and other special forest products will be managed to benefit other resources and offered for sale when they have an economic value and utilized or treated if there is no economic value. Probable Sale Quantity (PSQ) will be 7000 Tons/year for all forest and woodland products.

MD-3: Incidental or casual use of plant materials will be allowed, except that only above ground plant gathering will be allowed in the Fossil Cycad ACEC and Fort Meade ACEC. Firewood gathering is allowed for camping or other uses if it is within casual or incidental use definitions (refer to glossary), Firewood gathering may be allowed through a permit basis if such use does not meet casual or incidental use definitions. For additional information related to ACECs refer to MD-1 (Fossil Cycad ACEC) and MD-17 (Fort Meade ACEC) under the ACEC portion of Special Designations.

MD-4: Snag and cavity bearing tree cutting, removal, and offer for sale or utilization will be allowed for public safety, salvage post fire, and/or in response to other resource needs.

MD-5: Unless otherwise restricted, new permanent roads may be built for long-term management of areas where multiple entries would be necessary to meet objectives. New road construction will be kept to the minimum (construction standard, number and length) necessary for multiple use management. Rerouting and maintenance of existing authorized roads will be allowed to reduce impacts on resources. Temporary road construction will also be kept to a minimum and decommissioned as part

of the project. This applies only to roads associated with forest treatments or removal of forest products.

MD-6: If goshawk nest areas occur within ½ mile of project area and a protected area has not been identified, the project analysis will determine whether some of the acreage should be protected.

MD-7: A range of forested conditions (open savannah to dense canopy, newly regenerated to mature stands) will be maintained in the forest and woodland types.

MD-8: All appropriate silvicultural systems (Even-aged, Two-aged, Uneven-aged) will be available for management.

MD-9: All silvicultural tools will be available (mechanical thinning, hand thinning, horse logging, planting, prescribed burning, cable logging, chemical treatments, pheromone application, etc.) to provide the desired results.

MD-10: Forestry BMPs for South Dakota will be followed for forest and woodland projects (**Appendix J**).

MD-11: Retain, where existing, a minimum of 2 existing snags per acre greater than 16 in DBH and 30 ft. tall, unless a safety hazard. Salvage or felling of dead or dying trees will be acceptable.

MD-12: Forest treatments will retain or improve turkey roost sites.

MD-13: Cross-country travel will be allowed for forest management practices under the terms of a permit.

MD-14: Mitigation, BMPs and Guidelines: Mitigation measures will be applied on a case-by-case basis during activity level planning consistent with the management actions and restrictions found in this section and the Guidelines and BMPs listed in **Appendix J**.

3.2.17 Livestock Grazing

Refer to the Special Designation Section for additional Goals and Management Decisions for ACECs.

Goal 1: *Manage for a sustainable level of livestock grazing while meeting or progressing toward the Dakotas Standards for Rangeland Health (**Appendix J**) recognizing the ecological benefits of moderate levels of large animal grazing in the Great Plains.*

Goal 2: *Manage livestock grazing to provide economic opportunities in the planning area.*

Objective 1: For allotments without approved specific management objectives and established grazing strategies, the utilization level as measured at the end of the grazing season will not exceed 50% on herbaceous forage plants on a pasture-wide basis or on selected key areas. Utilization will be monitored (within staffing capabilities and budget) to gauge effectiveness of management. Allotments with approved management plans will establish allowable use levels for grazing allotments through specific management objectives during the management planning process.

Objective 2: Across the planning area, BLM will allow permitted use levels consistent with the Missouri River Basin (MRB) surveys as outlined in the Animal Unit Month (AUM) Allocations portion of the Livestock Grazing section of Chapter 3. The permitted use levels take into account factors of trampled and soiled vegetation, ingestion by livestock, wildlife forage/cover requirements and watershed needs. See the AUMs portion of the Livestock Grazing section of Chapter 3 of the Proposed RMP and Final EIS (BLM 2015) for detailed example of livestock forage allocations.

Management Decisions

MD-1: Allocation of forage will be based on MRB surveys with consideration for needs of wildlife and watershed.

Adjustments to AUMs will be based on monitoring.

Adaptive Management: An increase in AUMs may be allowed (up to 5% within Decision Area).

Threshold: Allotment Management Plans (AMPs) are implemented and management practices in the AMPs to increase AUMs include improved grazing systems, range improvements, changes in season of use and/or stocking rates, etc. An allotment will be monitored for three years following an adjustment. If increased AUM harvest is found to cause a decrease in range condition, then AUMs will be reverted to the number of AUMs prior to the increase. Decreases in original AUMs will occur only after other methods to better distribute and manage livestock have been tried and failed.

MD-2: Livestock grazing will be allowed on about 272,000 acres. The amount of forage that could be available for permitted use on these lands will be about 77,300 (AUMs).

MD-3: On allotments found to exceed 50% utilization (by weight) at the end of the grazing season, utilization will be measured or monitored in every pasture of the allotment at the end of the following grazing season. Utilization limits on specific allotments may vary based on site specific conditions and management pending project level environmental review.

Adaptive Management: Adjustments in livestock grazing management (livestock numbers and kind, seasons of use, rest etc.) may occur with additional monitoring* of livestock grazing effects.

Threshold: Two consecutive years of exceeding 50% utilization by weight on a pasture-wide basis. Adjustments will be based on monitoring.

*Additional monitoring includes vegetation attributes such as frequency, cover, density, production, structure and composition. Other non-vegetative attributes that could be monitored are hydrologic function and soil and site stability.

MD-4: Salt, minerals and protein supplements will be used to better distribute livestock grazing use and meet nutritional needs of livestock. Livestock supplements will not be allowed within ¼ mile of riparian areas. Adjustments to supplement locations will be made if found to create excessive disturbance to other resources.

MD-5: At the time a permittee or lessee voluntarily relinquishes a permit or lease, the BLM will consider whether the public lands where that permitted use was authorized should remain available for

livestock grazing or be used for other resource management objectives. This does not apply to or impact grazing preference transfers, which are addressed in 43 CFR, Part 4110.2-3.

MD-6: Yearlong leases on M and I allotments will only be allowed where no resource concerns exist, or when an AMP or terms and conditions on the grazing lease have been developed to address those concerns.

MD-7: Livestock grazing permits/leases will be transferred or renewed for Improve (I), Maintain (M) and Custodial (C) category grazing allotments where the AUMs and kind of livestock are the same as the previous permit/lease.

A screening criteria checklist (see Appendix K of the Proposed South Dakota RMP and Final EIS (BLM 2015)) will be reviewed and documented prior to transfer or renewal. Any subsequent updates or modifications to the direction in the screening checklist will be used.

In cases where the use will substantially differ from that authorized in the previous grazing permit/lease, management circumstances have changed since the previous lease was issued, or land health standards are not being met because of livestock grazing, a site-specific interdisciplinary environmental review will be undertaken.

MD-8: To limit the potential for disease transmission to bighorn sheep, no change in livestock conversions from cattle, horses, or bison to domestic sheep or goats will be allowed in allotments within current occupied bighorn sheep range. Transfer of grazing preference will only be allowed to livestock types other than domestic sheep and goats within current occupied bighorn sheep range.

New domestic sheep and goat allotments or conversions from cattle, horses, or bison to domestic sheep or goats will not be permitted within a minimum of 15 miles from known bighorn sheep range. This distance will be greater if deemed necessary through site-specific analysis and additional research findings.

To minimize contact with bighorn sheep, domestic sheep and goats used for weed control within 10 miles of bighorn sheep range will only occur with coordination with SDGFP.

If new bighorn sheep introductions are proposed in areas that are currently not occupied by bighorn sheep, BLM will take this information into consideration and analyze the impacts at the project level utilizing the same buffer distances listed above.

MD-9: Range improvements (such as improving or increasing water sources) will be allowed as part of an overall grazing strategy to benefit multiple resources. Mitigation measures for resource protection will be developed for each project.

MD-10: Areas identified for prescribed burning could be rested from livestock grazing up to one year prior to treatment if necessary to produce fine fuels to carry the burn, and for a minimum of one growing season following treatment to promote recovery of vegetation.

Adaptive Management: Prescribed livestock grazing following fire could be implemented prior to the minimum rest period. The prescribed livestock grazing will be used for special management purposes

such as reducing annual plant invasion where site-specific interdisciplinary planning and the NEPA process have determined it to be a viable management option.

Threshold: When an interdisciplinary review has determined that plant communities will move away from those plant communities that support the integrity of the ecological processes (water, energy, and nutrient cycles) without prescribed livestock grazing.

MD-11: Grazing in areas with high concentration of Special Status Plant plants will not be allowed unless beneficial or negligible impacts will occur as determined through a review by an interdisciplinary team.

MD-12: To protect other resource values, new grazing allotments will not be authorized in the Exemption Area unless capability criteria are met for 50% of the proposed allotment acres.

The grazing lessee will be required to fence new allotments.

Grazing will also be allowed throughout the Exemption Area for beneficial resource uses such as fuels treatments, weed control, etc. Any such treatments will be completed following a site-specific interdisciplinary team analysis.

Capability criteria are as follows: Capable for cattle grazing; slope less than or equal to 30%, range production above or at 200 lbs/acre, wind/water erodibility at slight to moderate. Sheep grazing capability is the same as cattle except the slope cutoff is 45%. Areas not meeting these criteria are shown in Map 2-24 of the Proposed South Dakota RMP and EIS (2015). There will be approximately 1,294 acres capable for cattle grazing outside of existing allotments and approximately 2,435 acres non-capable for cattle grazing. There will be approximately 1,608 acres capable for sheep grazing outside of existing allotments and approximately 2,121 acres non-capable for sheep grazing.

MD-13: Livestock grazing will be managed through implementation of the Dakotas Standards for Rangeland Health and Guidelines for Livestock Grazing Management (**Appendix J**).

MD-14: Implementation of existing AMPs and development of new AMPs for priority allotments (I and M Allotments) will continue.

MD-15: BLM will complete assessments for rangeland health on a priority allotment basis with emphasis on allotments with significant acreage of public land, T&E species, and resource problems or issues (e.g., I and M category allotments).

MD-16: BLM will work cooperatively on integrated ranch planning so that ranch operations with a combination of BLM/deeded/other leased lands can be properly planned and coordinated.

MD-17: Prioritize allotments for AMP development, habitat improvement projects, rangeland health assessments and other range-related activities within sage-grouse priority habitat, riparian areas, and other high priority locations.

MD-18: Prioritize completion of rangeland health assessments and processing grazing permits/leases within PHMA.

MD-19: New fences will follow BLM specifications (BLM Handbook 1741-I and WO IM-2010-022) to allow for wildlife passage and located or marked as feasible to minimize collisions and other wildlife issues, except for fences built specifically to keep wildlife out of an area.

MD-20: Existing fences will be reviewed to identify areas where fence modification or removal could be implemented to improve wildlife movement.

MD-21: Functional wildlife escape ramps will be installed and maintained on all water tanks on BLM lands.

MD-22: Temporary stocking rate adjustments will be done in response to changing conditions (drought, fire, etc.) and desired vegetative response (e.g., livestock use to modify vegetation).

MD-23: Certified weed seed free forage (hay and grains) straw and mulch will be required for all activities when used on BLM lands (exceptions could be made for emergencies when approved by the BLM AO).

MD-24: Joint cooperative monitoring with grazing lessees will be highly encouraged as outlined in IM No. 2006-100 and IB No. 2010-015.

MD-25: Requests to divide or combine grazing allotments will be denied when it does not result in proper and efficient management of public rangelands (43 CFR, Part 4110.2-4).

MD-26: Unless specifically precluded on the lease or permit, administrative use motorized cross-country travel (including aircraft) will be allowed to maintain or repair range improvements, treat or move livestock, spray weeds, monitor animal and range conditions, and complete other management tasks directly associated with livestock and range management. BLM may restrict or prohibit administrative cross-country motorized travel in specific areas to protect resources, address safety issues or limit other conflicts associated with cross-country travel.

MD-27: Adjustments to livestock management practices or livestock numbers will be made based on results of monitoring studies, rangeland health assessments, allotment evaluations, interdisciplinary review and consultation, cooperation and coordination with the affected lessee. Guidelines for Grazing Management include practices which mitigate livestock grazing (**Appendix J**). Additional site-specific mitigation will be identified and implemented through environmental review that is completed at the implementation phase (project level) when AMPs or grazing lease renewals occur. Other applicable BMPs and Guidelines as described in **Appendix J** will also be used to mitigate impacts.

3.2.18 Recreation

Refer to the Special Designation Section for additional Goals and Management Decisions for ACECs.

Goal 1: *Provide for a range of recreational opportunities while minimizing adverse impacts on other resources.*

Goal 2: *Encourage community partnerships with BLM for the purpose of improving the recreational opportunities in response to the needs of visitors and local communities.*

Objective 1: The planning area will be managed for approximately 11,652 acres (Fort Meade ACEC and the Exemption Area) of Front Country Recreation Setting Characteristics; 261,325 acres of Middle Country Characteristics; and 320 acres (Fossil Cycad) of Back Country Characteristics.

Objective 2: The Exemption Area will be managed for Roaded Natural recreation opportunities

Management Decisions

MD-1 Recreation Management Areas: Approximately 259,936 acres will be Public lands not designated as Recreation Management Areas. Camping limits, recreation permit/fees, conditions of use, travel types and modes may be regulated to achieve or maintain setting characteristics.

MD-2 Special Recreation Management Areas (SRMA): Approximately 11,652 acres (Fort Meade ACEC; 6,574 acres and the Exemption Area; 5,078 acres) will be designated SRMA. Fort Meade will be managed under the most current Fort Meade Recreation Area Management Plan. Exemption Area Recreation Management Plan will be developed for Recreational Setting Characteristics (RSCs). Maps of these areas are shown in Section 3, Figures 3-2 (Exemption Area) and 3-3 (Fort Meade ACEC).

MD-3 Recreation Setting Characteristics : The planning area will be managed for approximately 11,652 acres (Fort Meade ACEC and the Exemption Area) of Front Country Recreation Setting Characteristics; 261,325 acres of Middle Country Characteristics; and 320 acres (Fossil Cycad) of Back Country Characteristics.

MD-4 Camping:

- a) Camping will be allowed on BLM surface administered lands, with a 16 day stay limit and a minimum ½ mile move on dispersed camping areas.
- b) Motorized travel cross country for camping purposes will be limited to within 300 feet of existing roads and trails after locating the campsite in a non-motorized fashion.
- c) Campfires will be allowed unless restricted by fire closure.

MD-5 Road Designation: Planning Area will be designated as LIMITED for transportation purposes. Motorized travel will be allowed on existing roads and trails, or designated roads and trails in Travel Management Areas (TMAs). Designation of roads and trails will be determined in future travel/transportation planning process in accordance with the chosen alternative. Roads and trails may be closed to protect resources. New roads and trails may be developed.

MD-6 Hunting/Outfitter/Guide Permits/Trapping:

- a) Hunting will be allowed according to state regulation and Outfitter/guide types of SRP may be issued. Priority for these permits where there is a conflict will be based on a first come basis.
- b) Trapping will be allowed according to state regulation. Refer to Fort Meade ACEC actions for additional information on trapping.

MD-7 Fisheries: Fish stocking will be allowed. Fish stocking will be coordinated with and conducted by the State in accordance with all state laws and regulations.

MD-8 Special Recreation Events: Special Recreation Use Permits (SRUP) will be issued when consistent with management objectives; evaluated on a case-by-case basis, analyzing natural and cultural resource conditions, visitor safety, conflicting resource uses, and other current conditions or needs. SRPs will be required for any commercial, competitive, group use, and/or vending activities. Conflicts between permit applications that are otherwise acceptable will be resolved on a first come priority basis.

MD-9 Geocaching: Geocaching will be allowed if it does not create ground disturbance, is not placed in or on historic features, artifacts or structures, and is not commercial in nature.

MD-10 Recreational Gold Panning: Recreational gold panning will be allowed except at Fort Meade ACEC and Fossil Cycad ACEC. Recreational gold panning could be restricted if monitoring determined negative impacts on resources. Streams may be identified and up to 20 acres could be recommended for withdrawal from mineral entry to provide a recreational gold panning opportunity.

MD-11 Recreation and Gathering of Plant Materials : BLM-administered lands will be available for other non-consumptive recreational pursuits such as bird watching, sledding, walking, cross-country skiing (ungroomed), meditation, etc. SRPs will be required when activities involve groups. Gathering of plant materials for incidental use will be allowed, except that only above ground gathering will be allowed in the Fossil Cycad and Fort Meade ACECs (does not include firewood gathering).

MD-12 Recreational Sites: Surface occupancy and use will be prohibited within ½ mile of the SRMAs Fort Meade ACEC and Exemption Area.

O&G – NSO: Surface occupancy and use will be prohibited within ½ mile of the SRMAs including Fort Meade ACEC and Exemption Area.

MD-13 ROWs in SRMAs: ROWs for renewable energy will be excluded. ROWs for other uses will be avoided within ½ mile of SRMAs (Fort Meade ACEC, Exemption Area and other developed recreation sites).

MD-14 Travel with Vehicles Equipped to Travel over Snow: Snowmobiles and vehicles specifically equipped to travel over snow will be unrestricted unless adverse impacts on resources or infrastructure occurs, safety issues become evident or snowmobile use in important wildlife use areas increases to the point that it becomes disruptive (refer to glossary) to wildlife. Note that additional snowmobile restrictions in the Fort Meade ACEC and the Exemption Area may apply as shown under the Exemption Area or the Special Designation section (Fort Meade ACEC portion) of this table. Additional restrictions or closures may be developed through travel planning conducted at the implementation level.

MD-15 Recreation Opportunity Classification: Exemption Area will be managed for Roaded Natural recreation opportunities.

MD-16 Recreational Management Areas: The Exemption Area will be designated as a SRMA. Specific planning document will be developed.

MD-17 Camping: Designated camping areas and associated regulations may be developed. Black Hills Fire Protection District rules shall apply to campfires on BLM land.

MD-18 Roads and Trails: The Mickelson Trail and State Snowmobile trail system will continue to be managed by the State of South Dakota and use on these trails will be regulated by that agency. Snowmobiling will be restricted to designated trails. Hiking trails around Deadwood and potential OHV trail connecting Deadwood to other trails may be developed. Other motorized travel will be limited to existing trails until the Travel Management Plan designates roads and trails for motorized travel. Roads and trails may be closed to protect resources. New permanent and temporary road construction, maintenance, rerouting, and decommissioning will be allowed.

MD-19: Fish stocking will be allowed. BLM will increase fishing opportunities by development of ponds, such as a pond near the Homestake Powderhouses, dependent upon water availability and dam constraints.

MD-20: Recreation Use Permits: Permits will be required at developed, designated campgrounds.

MD-21 Recreation Facilities: Maintain existing recreation facilities and areas in a safe condition.

MD-22 Recreation opportunities: Emphasize recreation opportunities not provided by the private sector or other public lands.

MD-23 Weed Free Forage: Forage brought onto BLM-administered public land will be required to be certified weed free forage.

MD-24 Shooting: Firearm shooting will be allowed except where specifically restricted or prohibited. Areas may be closed or restricted to firearm shooting if safety issues arise, littering occurs, or conflicts with other resources or resource uses occur. Coordination with user groups and the public will be conducted to resolve conflicts and problems if they are discovered. Closure will be considered only if conflicts or problems cannot be resolved through other means. BLM will notify adjacent local governments of events requiring SRUPs or authorized use.

MD-25 Fishing: Fishing will be allowed under state fishing regulations.

MD-26 Special Recreation Use Permits: BLM will issue SRUPs based on evaluation of criteria including but not limited to analyzing natural and cultural resource conditions, visitor safety, conflicting resource uses, and other current conditions or needs.

MD-27 Special Recreation Permits: Applications for SRPs in sage-grouse PHMA may be denied if approval of the permit would adversely impact sage-grouse or sage-grouse habitat.

MD-28 Outfitter/Guides: Outfitter/guide hunting activities on public lands within grazing allotments under agreement with the State of South Dakota for wildlife or public access purposes will not be allowed and therefore will be excluded from the issuance of Outfitter/Guide SRP. Exceptions may be allowed in cases where only a portion of the allotment is under agreement with the State.

MD-29 Non-Recreation Management Areas: Public lands not designated as Recreation Management Areas are managed to meet basic Recreation and Visitor Services and resource

stewardship needs. Recreation opportunities are allowed that are not in conflict with the primary uses of these lands.

3.2.19 Travel and Transportation

Refer to the Special Designation Section for additional Goals and Management Decisions for ACECs.

Goal 1: *Manage transportation and access to provide for use and enjoyment of the public lands while protecting resource values and providing for user safety.*

Goal 2: *Access is available to larger blocks of BLM-administered surface lands.*

Goal 3: *Manage transportation network to enhance a variety of uses of public lands.*

Management Decisions

MD-1 TMAs: Three TMAs will be developed: Fort Meade Recreation ACEC, Exemption Area, and Center of the Nation (the large blocks of public lands in Northern Butte and Southern Harding counties). These areas will be considered focus areas when implementation planning for transportation (OHV, including snowmobile use, aerial, and non-motorized travel) is initiated. TMAs are a flexible planning tool and may be changed without a formal decision-making process as circumstances warrant.

MD-2 Motorized Cross Country Travel: OHV cross-country travel will be limited to 300 feet from nearest road to retrieve big game animals. This action may be revised or changed during travel management planning and this type of cross-country travel could be prohibited in specific areas pending site-specific environmental review.

MD-3 Cross Country Travel to Access Campsites: OHV travel will be allowed within 300 feet of roads to access campsite by direct route. This action may be revised or changed during travel management planning and this type of cross-country travel could be prohibited in specific areas pending site-specific environmental review.

MD-4 Travel with Vehicles Equipped to Travel over Snow: Snowmobiles and vehicles specifically equipped to travel on snow will not be limited to designated roads and trails unless monitoring indicates degradation to natural resources, disturbance to wildlife, or safety problems. This type of equipment use could be restricted in parts of the planning area through subsequent travel management planning.

MD-5 Construction of new roads: New permanent roads may be built for long-term management of areas where multiple entries will be necessary to meet objectives. New road construction will be kept to the minimum (construction standard, number and length) necessary for multiple use management. Rerouting and maintenance of existing authorized roads will be allowed to reduce impacts on resources. Construction of temporary roads could be authorized through project level planning and will be kept to a minimum, decommissioned and reclaimed as part of the project.

MD-6 Road and Trail Designations: The planning area will be designated as an 'OHV Limited Area', except for the Fort Meade and Fossil Cycad ACECs which will be 'OHV Limited to Designated Routes'. The OHV limitation will ultimately be to 'OHV Limited to Designated Routes' for the planning area as determined through a subsequent implementation/activity level Travel Management Plan(s). In the interim OHV use on existing routes may occur, however no new routes may be created without specific

authorization. Roads and trails may be closed to protect resources. New roads and trails may be developed.

MD-7 Exemption Area: Mickelson Trail and State Snowmobile Trail: Snowmobile and other vehicles modified for snow travel use will be limited to designated routes. Cross-country travel by over snow vehicles will not be permitted.

MD-8 Motorized wheeled vehicles: Other vehicle travel (motorized wheeled vehicles) will be limited to existing roads and trails until such time that a Travel Management Plan is developed. Travel by the motorized wheeled vehicles will be limited to designated roads and trails after the Travel Management Plan is developed.

MD-9 Exemption Areas: Motorized Travel: Non-motorized trails will be developed in coordination with partners and user groups and included in the Travel Management Plan.

MD-10 Fort Meade, Exemption Area and Center of the Nation: The Exemption Area (**Figure 3-2**) and the Center of the Nation (**Appendix A2**, Map C show areas designated as TMAs. Areas will be designated as open, closed, or limited to various modes of transportation through implementation level planning that will be conducted after the ROD for the ARMP is signed. Until such time, all roads on BLM administered surface are designated as limited.

MD-11 Access: Acquire or retain access to public lands to improve management efficiency.

MD-12 Access: Existing mode of travel for accessing private lands through BLM will be continued unless adverse resource impacts are occurring.

MD-13 Access coordination with State: Coordinate with SDGFP, the Commissioner of School and Public Lands, lessee(s), and adjacent landowners concerning designation of access including routes on BLM-administered public land that is adjacent or within hunting management areas such as Walk-In areas, etc. (South Dakota Hunting Atlas, printed annually).

MD-14 Cultural sites: Travel routes through cultural resource sites will be rerouted or mitigated.

MD-15 Designation of routes: The planning area will be designated as an 'OHV Limited Area', except for the Fort Meade and Fossil Cycad ACECs which will be 'OHV Limited to Designated Routes'. The OHV limitation will ultimately be to 'OHV Limited to Designated Routes' for the planning area as determined through a subsequent implementation/activity level Travel Management Plan(s). In the interim OHV use on existing routes may occur, however no new routes may be created without specific authorization. BLM may restrict or prohibit administrative or authorized cross-country motorized travel in specific areas to protect resources, address safety issues or limit other conflicts associated with cross-country travel.

MD-16 Temporary Travel restrictions: Temporary travel restrictions will be implemented in emergency situations to comply with fire restrictions or protect the soil and water quality.

MD-17 Coordination with road maintenance: Work in coordination with federal, tribal, state, and county agencies, private landowners, and organizations for road maintenance issues for existing and new roads.

MD-18 Easements: As opportunities arise BLM will establish or maintain access easements for administrative and/or for public use with priority on public access to larger blocks of BLM administered lands.

MD-19 Disabled hunter/angler access: Game retrieval Authorization of cross-country motorized travel for disabled hunter/angler access and game retrieval may be allowed in cooperation with SDGFP by special authorization.

MD-20 Cross County travel for disabled: Authorization of cross-country motorized travel for other types of disabled user access will be addressed on a case-by-case basis and will require special authorization.

MD-21 Back Country Byway: Back Country Byway designation and management will continue as detailed in the 1996 Fort Meade ACEC Management Plan.

MD-22 NSHT: Future NSHTs may be designated as a Special Designation and management plans developed.

MD-23 Transportation /utility corridors: Designated transportation /utility corridors will be located along I-90, State Highway 34 and the Bear Butte Road as described in the Fort Meade ACEC Plan (1996). The ACEC is shown in **Figure 3-3**. Roads will be constructed at the minimum standard necessary. An environmental review will be completed if an upgrade is proposed for other purposes that require a higher standard.

MD-24 Guidelines and BMPs: Guidelines and BMPs will be used to mitigate impacts of transportation (**Appendix J**).

MD-25 Upgrading of routes: Allow no upgrading of existing routes that will change route category (road, primitive road, or trail) or capacity unless the upgrading will have minimal impact on sage-grouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road.

MD-26 Aircraft use: Approval of permanent or temporary air strips will be determined through project level planning.

MD-27 Aircraft use: Aircraft landings and takeoffs will be allowed for the purposes of search and rescue, law enforcement activities, wildfire suppression, military training and operations, or emergency activities and other authorized uses.

MD-28 Aircraft use: A vender will need a SRP to become an air taxi service.

3.2.20 Lands and Realty

Land Use Authorizations

Goal 1: Address needs of industry, utilities, the public, or government entities for land use authorizations (ROW, leases and permits) while minimizing adverse impacts on other resource values.

Goal 2: Locate new ROW facilities adjacent to existing ROWs to the extent practical.

Management Decisions

MD-I ROWs: The Fort Meade ACEC is a ROWs exclusion area except for the Fort Meade utility corridors which will be open (**Figure 3-3**). Fossil Cycad ACEC is a ROW avoidance area. Important wildlife, VRM Class II areas and special status species habitat, PHMA, floodplains, and soils that are vulnerable to impacts will be ROWs avoidance areas. Minor ROWs within 2 miles of leks and Major ROWs will be avoidance in GHMA. VRM Class III and IV will be open.

Surface Acres affected will be as follows:

Open: 19,903 acres

Avoidance: 247,551 acres

Exclusion: 5,836 acres

Table 3-2
Summary of ROW Restrictions

(Does not include renewable ROWs restrictions)

Resource	Restriction
Fort Meade ACEC/SRMA +buffer	Exclusion
Fossil Cycad ACEC	Exclusion
Exemption Area SRMA +buffer	Avoidance
Greater Sage-Grouse PHMA	Avoidance
Greater Sage-Grouse GHMA/lek	Avoid (Major) Avoid 2mi lek (Minor)
Colonial Nesting Water bird Colonies	Avoidance ½ mi Exclusion ¼ mi
Greater Sage-Grouse nesting & brood rearing areas	Avoidance
Big game/sage-grouse wintering areas	Avoidance
Sharp-tailed/greater prairie-chicken lek buffers	Avoidance
SSS raptor nests	Avoidance
Raptor nests	Avoidance
Sprague's pipit	Avoidance
Bighorn sheep range	Avoidance
Blackfooted ferret habitat	Exclusion
Prairie dog colonies	Avoidance
Least terns/piping plover habitat	Avoidance
Fisheries	Avoidance
Pallid & SN Sturgeon	Avoidance

Table 3-2
Summary of ROW Restrictions

(Does not include renewable ROWs restrictions)

Resource	Restriction
VRM Class II	Avoidance
VRM Class III & IV	Open
Streams, water bodies, floodplains, wetland, riparian	Avoidance
Sensitive soils (including steep slopes)	Avoidance
Badland/rock outcrop	Avoidance

Appendices R and S provide a more detailed summary of ROW restrictions.

MD-2 Burial of Utility and power lines: All new power and utility lines (fiber-optic, telephone, power lines etc.) that can be safely buried will be buried. When burial is not safe or practical, new lines will be sited to have the least impact on resources.

O&G – CSU: All fiber optic, telephone and power lines that can be safely buried will be buried or sited to have least impact on resources. All other utility lines will be evaluated at the project level.

MD-3 Unauthorized use: Unauthorized use, occupancy and development of public lands will be investigated and resolved either through termination and removal of facilities or issuance of an authorization. However, the option will be open to dispose of Category 2 lands by sale to resolve an unauthorized use.

MD-4 Scattering of cremated remains: Individual, noncommercial requests to scatter cremated remains will be considered casual use and addressed on a case-by-case basis in compliance with state laws and county ordinances. The SDFO may develop guidelines about appropriate scattering procedures and locations if conditions warrant. Commercial projects or events involving scattering of cremated remains will not be allowed.

MD-5 Land use authorization requests: Requests for land use authorizations (ROWs, leases, permits) will be authorized and mitigation applied on a case-by-case basis

MD-6 Contamination: No authorizations will be issued for activities that could result in the contamination of the public lands.

MD-7 RS-2477 Roads: Issues in connection with RS 2477 roads will be subject to current guidance.

MD-8 Avian protection: Follow “Reducing Avian Collisions with Power Lines” (APLIC 2012) for all applicable land use authorizations.

MD-9 Existing rights: ROW avoidance and exclusion areas will be subject to valid existing rights.

MD-10 Communication sites: No communications site areas will be designated but should any communications sites facilities be authorized, BLM will encourage co-location where possible.

MD-11 Recreation and Public Purposes (R&PP) leases: Retain and renew existing R&PP leases as long as they are compatible with the objectives in this management plan.

MD-12 Underground ROWs: All underground ROWs that are terminated will remain buried unless there is a threat to life and degradation of resources.

MD-13 R&PP and other classification: R&PP and other classifications will be allowed as needed, but no lands will be suitable for Desert Land Entry (DLE) or Indian allotment classification and application.

MD 14 ROW corridors: No new ROW corridors will be designated but applicants will be encouraged to use routes with other ROWs.

MD-15 Utility and transmission line ROWs: Utility and transmission line ROWs may be authorized in the Fort Meade ACEC ROW corridor pending environmental review (**Figure 3-3**).

MD-16 Access: As opportunities arise BLM will establish or maintain access easements for administrative and/or for public use with priority on public access to larger blocks of BLM administered lands.

3.2.21 Recommended Withdrawals

Goal 1: *Utilize withdrawal actions with the least restrictive measures and minimum size necessary to accomplish the required purpose.*

Goal 2: *Protect significant resources or significant government investments.*

Management Decisions:

MD-1 Recommended Withdrawals: Locatable federal minerals under Fort Meade ACEC (6,574 Acres) will be recommended for withdrawal. Fossil Cycad ACEC (320 Acres) and Bear Butte NHL (410 Acres) will be recommended for withdrawal from mineral entry.

MD-2 Withdrawals: All withdrawals will be reviewed prior to termination or as otherwise required by law to extend, modify, or retain.

MD-3 Modification or revocation: Modification or revocation will be recommended when the purpose for which the lands are withdrawn is no longer applicable to a portion or the entire withdrawal.

MD-4 Other agency requests: BLM will consider other agency requests for withdrawal relinquishment, revocation, extensions, or modifications.

MD-5 New withdrawals: New withdrawals will be considered on a case-by-case basis where resource values, protection of agency investments, or management could transfer to another agency. New withdrawal proposals will be considered on a case-by-case basis where management would transfer to another federal agency or when resource values or agency investment are best protected by withdrawal. New withdrawal proposals will include the minimum area required to meet the purpose of the withdrawal

MD-6 Revoked lands: Those lands having withdrawals revoked will be placed in the appropriate category based on Land Ownership Adjustment criteria found in **Appendix N**.

MD-7 Withdrawn lands returned to BLM management: These lands will be managed the same as adjacent public lands; or, if isolated the same as comparable, nearby lands provided that management on nearby or adjacent lands is consistent with BLM policy and the goals described in this ARMP.

MD-8 Fort Meade ACEC: The Fort Meade Recreational Area ACEC will remain withdrawn from locatable mineral entry, will remain closed to leasable mineral entry and will be closed to salable mineral entry.

3.2.22 Land Tenure

Goal 1: Retain public lands with high resource values in public ownership.

Goal 2: Adjust land ownership to improve public land pattern and management efficiency.

Goal 3: Acquire lands that enhance public access, high resource values and meets public and community needs.

Goal 4: Access is available to larger blocks of the BLM-administered surface lands at locations identified internally or from the public and users

Goal 5: Achieve a more management efficient and consolidated public land pattern.

Goal 6: Effects of infrastructure projects, including siting, will be minimized using the best available science, updated as monitoring information on current infrastructure projects becomes available.

Management Decisions

MD-I Land Ownership Adjustments: Land Ownership Adjustment will be considered on a case-by-case basis based on retention, acquisition, and disposal criteria found in **Appendix N**.

This will result in the following acres within the categories:

Category 1 – Retention area with no disposal (6,894 acres): Lands managed in Category I – Retention will include all ACECs and lands acquired through Land and Water Conservation Fund. Category I lands will not be transferred from BLM management by any method for the life of the plan.

Category 2 - Retention with Limited disposal potential based on specialist review (179,950 acres): Public lands within Category II will be considered for limited land ownership adjustments; however, lands in Category II will not be available for sale under section 203 of FLPMA. Greater Sage-Grouse PHMA and GHMA will be category 2. Lands classified as habitat for Greater Sage-Grouse (PHMA or GHMA) will be retained in federal management unless: (1) the agency can demonstrate that disposal of the lands, including land exchanges, would provide a net conservation gain to the Greater Sage-Grouse or (2) the agency can demonstrate that the disposal, including land exchanges, of the lands would have no direct or indirect adverse impact on conservation of the Greater Sage-Grouse.

Category 3 – Disposal contingent on specialist review (86,474 acres): These lands generally are isolated or fragmented from other public land ownerships making them difficult to manage. Public land parcels in

this category are relatively smaller in size (typically 160 acres or less). A map of these disposal parcels can be found within **Appendix AI**, Map 2-10 and **Appendix AI**, Map E. These parcels have been found to potentially meet the sale criteria of section 203(a)(1) of FLPMA and could be made available for sale or disposal through any method.

Refer to **Appendix N** for additional details. This will result in the following acres within the categories:

Category 1 – Retention area with no disposal (6,894 acres).

Category 2 - Retention with Limited disposal potential based on specialist review (202,395 acres).

Category 3 – Disposal contingent on specialist review (64,030 acres)

MD-2 Jurisdiction: Jurisdictional transfers with other federal agencies will be considered. Types – consolidated for increased efficiency or no longer needed by the other agency and/or will serve the public or National interest.

MD-3 Disposal of lands: Disposal of lands in the Exemption Area will be considered for sale, exchange or R&PP patent unless the parcel contributes to the designation of an SRMA.

MD-4 Land Transfers: Transfer of up to 170 acres of BLM-administered lands to the Black Hills National Cemetery may be allowed, provided that impacts are minimal and the transfer is consistent with management goals and objectives. If the proposed transfer does not occur the land will remain part of the ACEC.

MD-5 Land Transfers: Up to six acres of BLM-administered land in the Fort Meade ACEC (lands adjacent to the sewer lagoons) will be considered for transfer to the City of Sturgis pending additional further environmental review.

MD-6: Lands or interest in lands could be acquired by purchase, exchange, revocation of another agency's withdrawals, administrative transfer from another agency, cooperative agreement, or donation, where they complement existing resource values. All land or mineral ownership adjustments will be with willing partners or exchange proponents and the acquired lands will be managed as similar lands are under the approved RMP.

MD-7: Evaluate the proposed disposal tracts using the land tenure criteria (refer to the criteria listed in MD-1 and in **Appendix N**).

MD-8: Acquired lands will be managed under the same management prescription as adjacent public lands: or, if isolated, the same as comparable, nearby public lands. Provided that this management is consistent with BLM policy and the goals described in this ARMP.

MD-9: Parcels of land administered by BLM and discovered through land status updates and corrections will be managed as similar lands are managed under the approved RMP.

MD-10: Lands acquired within or adjacent to administratively designated special management areas, such as ACECs which have valuable resources, will be managed the same as the special management area.

MD-11: Access will be acquired from willing landowners using all acquisition methods.

MD-12: Retain existing access to BLM-administered lands in conveyance documents.

MD-13: Pursue reciprocal rights for public access when granting a BLM ROW, as appropriate.

MD-14: Management actions needed to protect newly acquired lands will be considered as part of the analysis prior to acquisition.

MD-15: All proposed land ownership adjustment actions will be evaluated under project level planning.

MD-16: The BLM will work with partners and willing landowners to proactively secure access to the public lands for the use and enjoyment of the public with consideration of the working landscape and the intermingled landownership pattern that is present.

MD-17: Acquire or retain public access to public lands within the retention areas.

3.2.23 Minerals

Refer to the Special Designation Section for additional Goals and Management Decisions for ACECs.

Goal 1: *Manage minerals to provide an opportunity for local economic benefits, while protecting the integrity of other resources.*

Goal 2: *Minerals are developed while wildlife, cultural resources, air and water quality, and other resource values are maintained.*

Goal 3: *As mineral development is completed, surface areas are restored similar to pre-existing conditions.*

Goal 4: *Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside of PHMA and GHMA.*

Recommended mineral withdrawal and closure summary: Locatable federal minerals under Fort Meade (6,574 Acres), Fossil Cycad ACEC (320 Acres), and Bear Butte NHL (410 Acres) will remain withdrawn/be recommended for withdrawal, while leasable federal minerals and salable federal minerals will be closed (no lease) in these areas. The Abandoned BHAD will be closed to leasable and salable minerals. Locatable minerals will be open.

Lease notices, lease stipulations and examples of COA for Fluid Minerals are shown in **Appendix G**. Lease notices, lease stipulations, and COAs address a variety of resource concerns and include specific practices and procedures to mitigate impacts and limit conflicts.

Lease notices (**Appendix G.4**) include but are not limited to:

- ESA Standard Lease Notice
- Migratory Bird Treaty Act Standard Lease Notice
- Sprague's Pipit Lease Notice

- Setback from Human Occupied Residences Requirement
- Air resources (tier 4 engine requirement)

Standard lease stipulations and lease notices (**Appendix G.2** and **G.3**) include but are not limited to

- Paleontological survey requirements
- Cultural survey requirements
- Tribal consultation requirements
- Mitigation for wildlife, special status species and other resources.

Common lease notices and stipulations are shown in **Appendix G.2** through **G.4**. For a more detailed list refer to http://www.blm.gov/mt/st/en/prog/energy/oil_and_gas/leasing/stipulations.htm.

Conditions of Approval

COAs are mitigation measures that implement restrictions in light of site-specific conditions. General guidance for COAs and surface operating standards is found in the BLM and Forest Service brochure entitled “Surface Operating Standards for Oil and Gas Exploration and Development” (USDI BLM 2007) and BLM Manual 9113 entitled “Roads”.

The BLM commonly applies BMPs when approving APDs. The sources of many of these may be found in **Appendix J** and on the internet at:

http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices.html

<http://www.blm.gov/bmp/> (a simpler internet address going to the same place)

http://www.blm.gov/mt/st/en/prog/energy/oil_and_gas/operations.html

COA (**Appendix G.6** and **G.7**) include but are not limited to the following topics:

- Surface Conditions
- Drilling Operations
- Hydraulic Fracturing
- Engineering
- Gas Flaring
- Issuance of ROWs
- Migratory Birds
- Notification and Report Requirements
- Plugging Requirements
- Hazardous Materials
- Paleontological and Cultural Stipulations
- Construction

- Environment
- Production and Development
- Further Seismic Testing
- Inspections
- Spacing Requirements
- Flow Lines
- Separating, Treating and Storage
- Abandonment
- Restricting reserve pits over shallow water tables
- Reserve pits and use of diesel fuel and other constituents
- Operation and maintenance activities and wildlife timing stipulations
- Noise disturbance

The lists provided above are not all inclusive. Refer to **Appendix G** and the websites listed above for more details.

Waivers, Exceptions and Modification (WEMs)

WEMs provide an effective means of applying “Adaptive Management” techniques to oil and gas leases and associated permitting activities to meet changing circumstances. The criteria for approval of WEMs should be supported by NEPA analysis, either through the land use planning process or site-specific environmental review. An exception, waiver, or modification must be based on one of two criteria. According to 43 CFR, Part 3101.1-4, “A stipulation included in an oil and gas lease shall be subject to modification or waiver only if the AO determines that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or if the proposed operations would not cause unacceptable impacts.”

Management Decisions

MD-1 Lands available for oil, gas leasing and geothermal leasing and stipulations: Public lands will be open and available for mineral exploration and development unless withdrawn, closed, or administratively restricted.

Some acres will be open to oil and gas leasing and development, subject only to the terms and conditions identified on the standard BLM lease form, or subject to additional seasonal or other minor constraints or subject to additional NSO or similar major constraints.

Stipulations attached to a lease may be excepted, modified, or waived at the discretion of the authorizing officer. WEMs are described in **Appendix G**.

For sage-grouse related stipulations in PHMA, waivers or modifications to a fluid minerals lease NSO stipulation will not be granted. The AO may grant an exception to a fluid mineral lease no-surface-occupancy stipulation in certain cases. Exceptions based on conservation gain (ii) may only be considered in (A) PHMA of mixed ownership where federal minerals underlie less than fifty percent of

the total surface, or (b) area of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of the ROD for this ARMP. See **Appendix G**.

MD-2 Mineral leasing: Federal oil and gas under Fort Meade (6,574 acres), Fossil Cycad ACEC (320 Acres), and Bear Butte NHL (410 Acres) will be closed (no lease).

Greater Sage-Grouse PHMA and the abandoned Igloo town site will be open to oil and gas leasing with NSO stipulations and the BHAD will be closed to leasing. Greater Sage-Grouse PHMA include 123,594 surface acres and 405,849 subsurface acres. All leasable minerals in the abandoned BHAD and the Igloo town site will be closed to exploration and development of oil and gas.

MD-3 Oil, gas and geothermal minerals: Types of restrictions and acres affected:

Table 3-3
Summary of Fluid Mineral Restrictions

Restriction Type	Surface Acres	O&G Mineral Acres
Closed	6,894	19,378
NSO stipulations	152,100	584,118
CSU stipulations	21,175	250,242
TL stipulation	1,169	8,616
Standard Terms	62,236	500,399

In the Planning Area 62,236 surface acres are open to leasing without BLM restrictions other than standard terms and conditions. There will be 500,399 mineral acres open without BLM restrictions other than standard terms and conditions.

Appendix S provides a more detailed summary of Fluid Mineral Stipulations.

MD-4 Application of oil, gas and geothermal stipulations for other uses: When applicable, stipulations developed for oil and gas development may be applied to other resource uses and activities pending environmental review at the project level (implementation level).

MD-5 Coal: An RMP Amendment will be necessary to address future expressions of interest in coal leasing, as well as following other laws relating to the analysis of coal development. Selected conservation areas (Fort Meade and Fossil Cycad ACECs, and Bear Butte NHL) are closed to coal leasing. Greater Sage-Grouse PHMA and the abandoned BHAD may be closed pending a suitability study.

MD-6 Coal Leasing: At the time an application for a new coal lease or lease modification is submitted to the BLM, the BLM will determine whether the lease application area is “unsuitable” for all or certain coal mining methods pursuant to 43 CFR, Part 3461.5. PHMA is essential habitat for maintaining GRSG for purposes of the suitability criteria set forth at 43 CFR, Part 3461.5(o)(1).

MD-7 Other leasable minerals: Area wide terms, conditions or other special considerations needed to protect other resources or values will be implemented while exploring or developing these types of minerals under the non-energy leasable regulations. Leasable solid Federal minerals will be closed under

Fort Meade (**Figure 3-3**) and Fossil Cycad ACECs (**Figure 3-4**), Bear Butte HL, sage-grouse PHMA (**Figure 1-3**) and BHAD (**Figure 3-1**). Igloo town site (**Figure 3-1**) will be NSO.

MD-8 Geothermal Leasing: Leasing and development of federal minerals for geothermal resource development within the planning area will be evaluated and considered if requested unless withdrawn or administratively restricted. Stipulations adapted for oil and gas leasing and operations will be applied to geothermal leasing and operations. Fort Meade and Fossil Cycad ACECs, Bear Butte NHL and BHAD will be closed to further consideration for geothermal leasing. Sage-grouse PHMA, within 6/10 of a mile around leks in GHMA and Igloo town site will be NSO. There will also be 2 mile CSU around leks in GHMA.

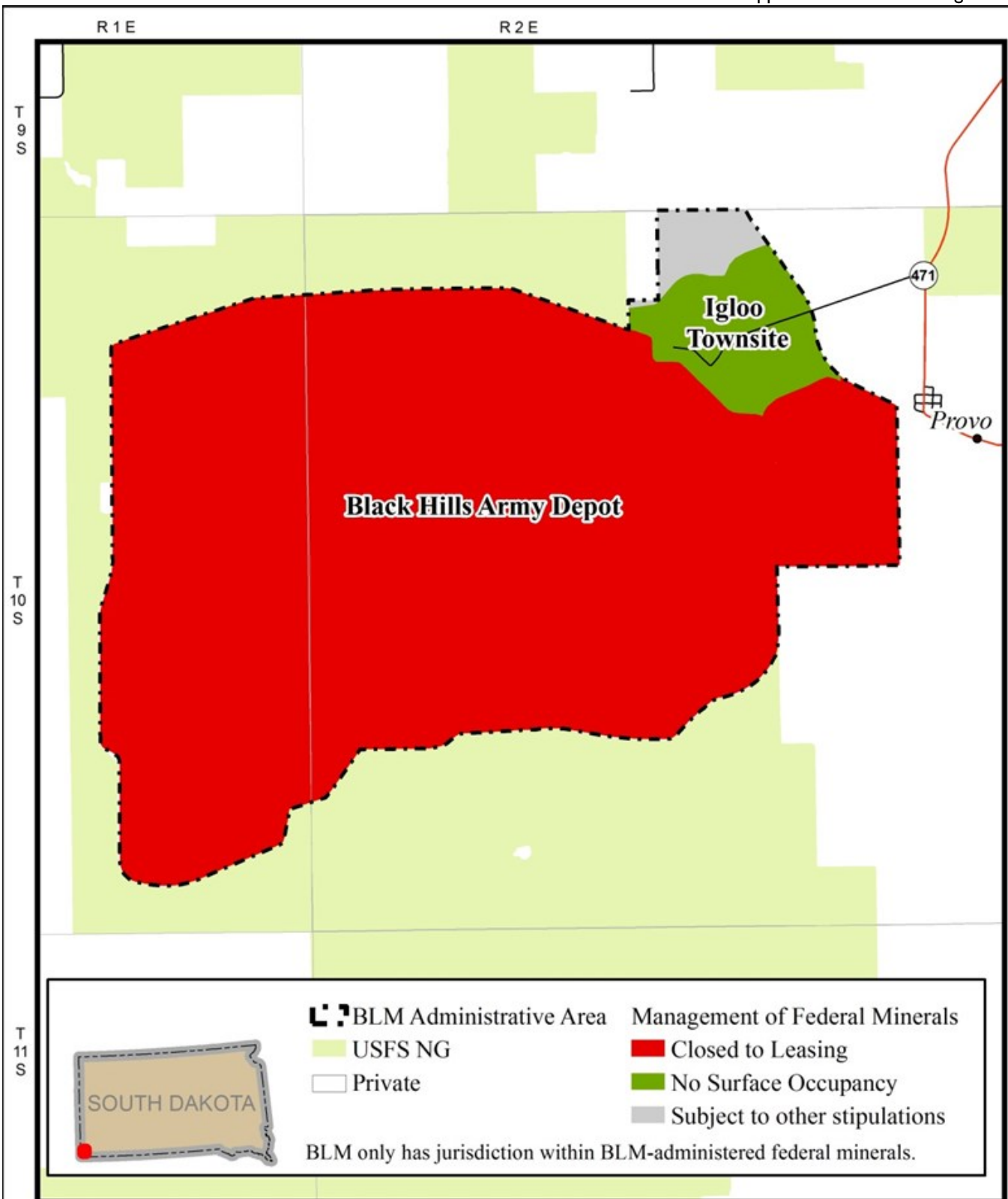
Greater Sage-Grouse habitat management areas are shown in Figure 1-2.

Waivers or modifications to a fluid minerals lease NSO stipulation will not be granted. The AO may grant an exception to a fluid mineral lease no-surface-occupancy stipulation in certain cases. Exceptions based on conservation gain (ii) may only be considered in (A) PHMA of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) area of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of the ROD for this ARMP.

MD-9 Use of oil and gas stipulations for geothermal: Applicable oil and gas and other leasable mineral stipulations and direction found in COAs and lease notices (**Appendix G**) may be applied to areas that are open to geothermal exploration and development if needed to limit impacts or conflicts with other resources and uses. Use of these stipulations would be determined through implementation level planning. Waivers or modifications to a fluid minerals lease NSO stipulation will not be granted in PHMA. The AO may grant an exception to a fluid mineral lease NSO stipulation in certain cases. Exceptions based on conservation gain (ii) may only be considered in (A) PHMA of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) area of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of the ROD for this ARMP.

MD-10 Locatable Minerals: Locatable Federal Minerals will be open and available for mineral exploration and development subject to special considerations needed to protect other resource values while conducting activities under the operation of the mining laws. Locatable federal minerals under Fort Meade ACEC (6,574 acres), Fossil Cycad ACEC (320 acres), and Bear Butte NHL (410 acres of mineral estate) will be recommended for withdrawal from further consideration for locatable mineral development.

MD-11 Standard mineral restrictions: Within the limits of the mining laws, applicable management actions or practices, including the leasable mineral Stipulations, COAs, Lease Notices, RDFs, BMPs and Guidelines, soil and water mitigation guidelines, COA, Lease notices, and Reclamation Guidelines (Appendices B, C, G, J, K, and L) of this ARMP may be applied to all mineral uses including a locatable mineral Plan of Operation or Notice as needed to protect resources or limit conflicts with other users. In addition to the guidance in these Appendices, other site specific evaluation, mitigation, monitoring and reclamation practices may be required. A phased approach may be required to limit the numbers of acres disturbed at any one given time. Application of these stipulations or practices would be determined through implementation level (project level) planning in coordination with the project proponent and the public.

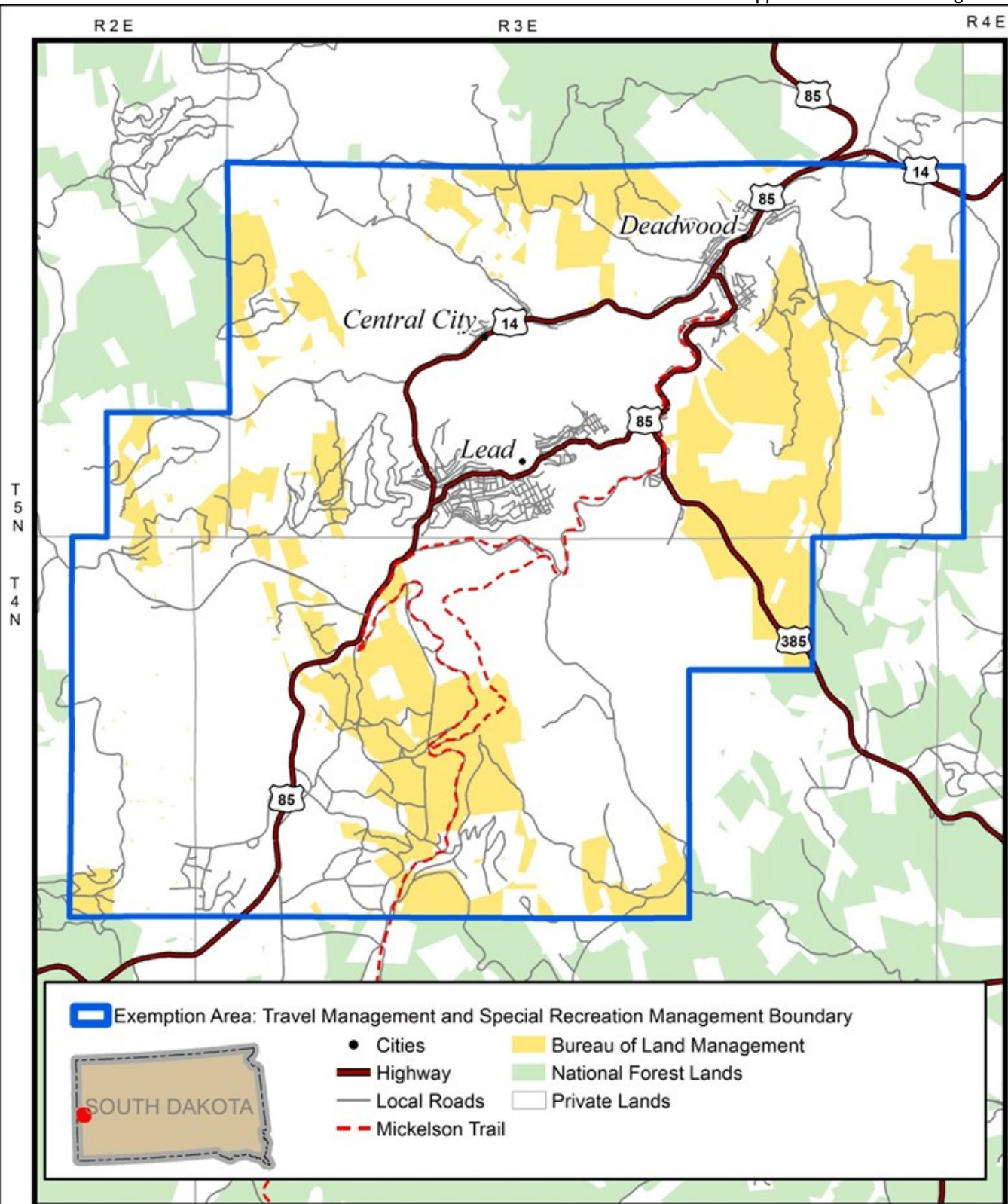


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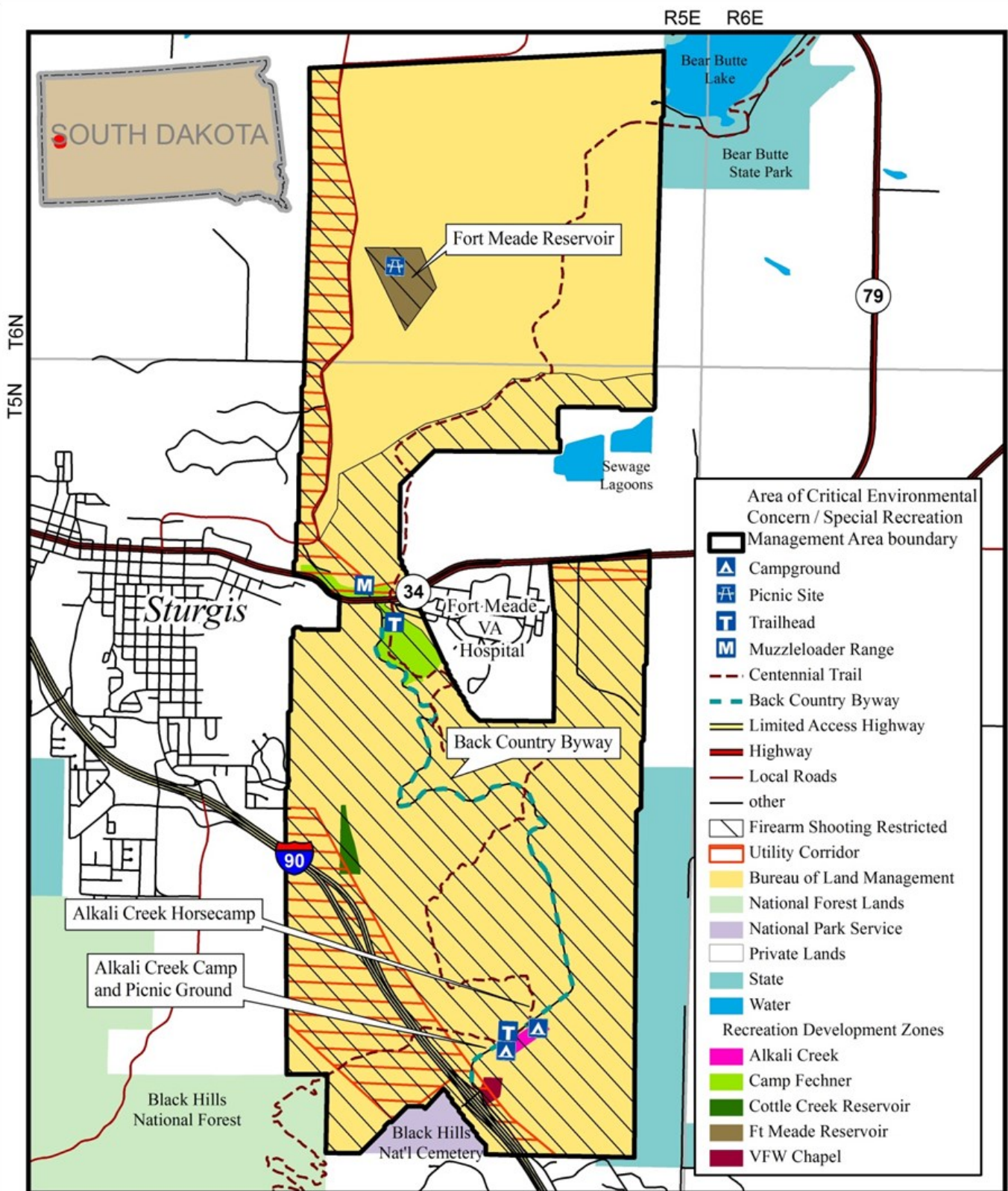


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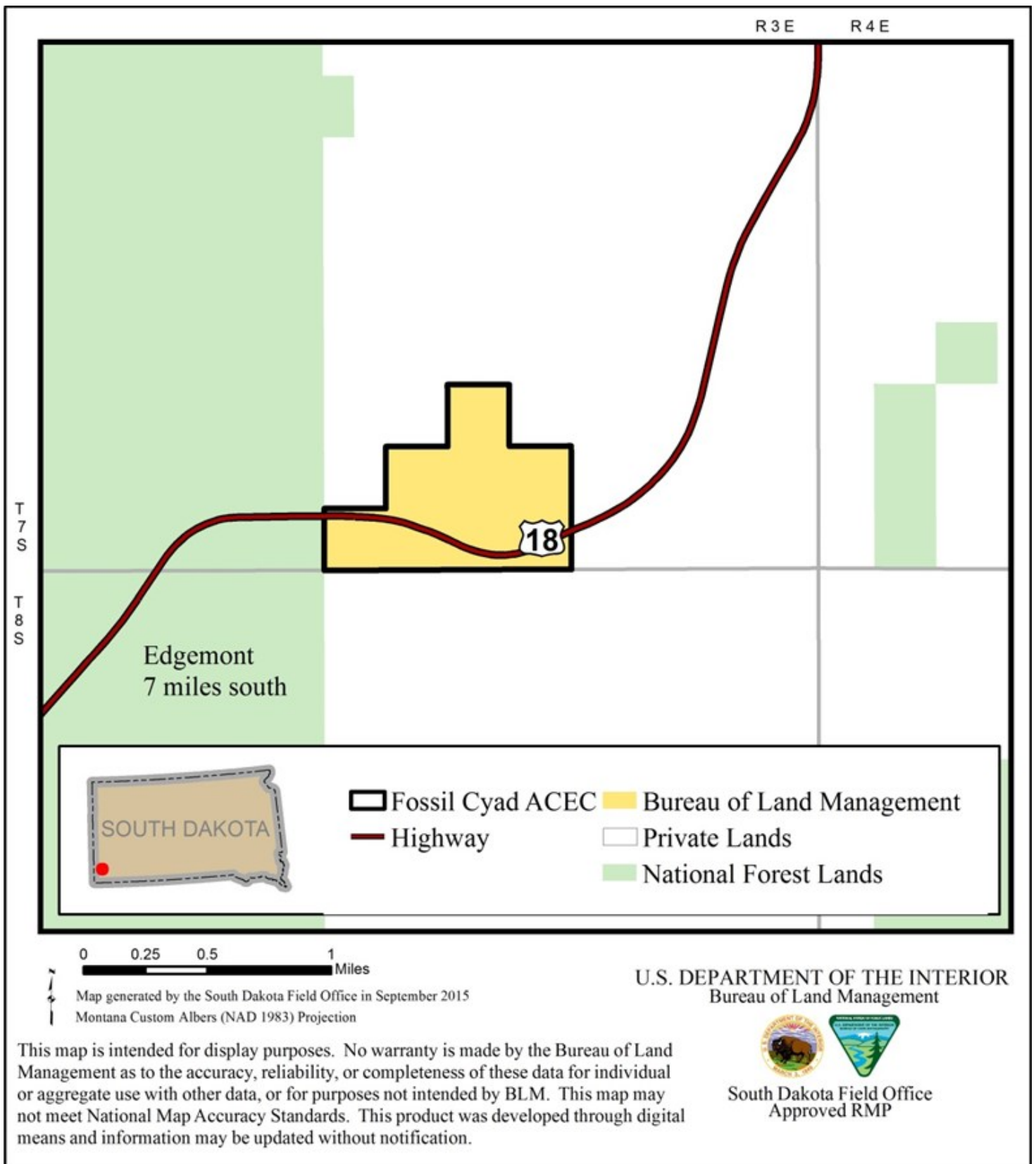
Montana Custom Albers (NAD 1983) Projection

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MD-12 Salable minerals: Salable Federal Minerals will be open and available for saleable mineral exploration and development subject to special considerations needed to protect other resource values while operating under the mineral materials regulations, except the abandoned BHAD, the town of Igloo, Fort Meade Recreation Area, Fossil Cycad ACECs, Bear Butte NHL and GRSG PHMA are closed to salable mineral development and exploration. In GRSG PHMA these areas remain “open” to free use permits and the expansion of existing active pits, only if the following criteria are met:

The activity is within the BSU and project area disturbance cap for sage-grouse; the activity is subject to the provisions set forth in the mitigation framework (Appendices D and J - Mitigation Measures, BMPs and SOPs), and RDFs for sage-grouse (**Appendix C**) and the activity is permissible under the sage-grouse subregional screening criteria.

MD-13 Salable mineral development and exploration: Within the limits of the mining laws, applicable management actions or practices, including the leasable mineral stipulations and direction found in COAs and lease notices, BMPs, soil and water mitigation guidelines, and reclamation guidelines (Appendices G, J, K, and L and Q) may be applied to a salable mineral proposal as needed to protect resources. In addition to the guidance in these Appendices, other site specific evaluation, mitigation, monitoring and reclamation practices may be required. A phased approach may be required to limit the amount of disturbance at any one given time.

MD-14 Consistency with State mineral laws: Minerals are managed with consideration of state laws.

MD-15 Access to minerals: Allow for needed road access, including new roads for mineral extraction operations with consideration of impacts on other resources.

MD-16 Exploration: Leasing and development decisions also apply to geophysical exploration.

MD-17 Mitigation: Mitigation of mineral development and exploration activities will be applied where needed to minimize impacts of mineral development consistent with the management actions and restrictions and stipulations found in this section and the Guidelines and BMPs listed in **Appendix J**. Mitigation measures will be applied on a case-by-case basis during activity level planning if review of the project area indicates resources would be affected.

MD-18 Waivers, Exceptions, and Modifications (WEMs): WEMs to lease stipulation requirements may be granted by the AO if an environmental review indicates that the stipulation does not apply (WEMs are described in **Appendix G**).

MD-19 Mitigation for GRSG: Applicable mitigation and conservation measures described for sage-grouse in **Appendix F** will apply to mineral development and exploration.

MD-20 Regulation 3809: If a waiver, exception, or modification is authorized, applicable portions of 43 CFR, Part 3809 regulations will still apply.

MD-21 Haz/Mat: In areas with known or potential hazardous waste or materials, BLM may defer oil and gas exploration and will not consider proposals to explore or develop other minerals until such time as the risks of these types of activities are fully known. Remedial action will be required as

necessary, subject to existing State and Federal laws and requirements prior to proceeding with a project.

MD-22 Black Hills Army Depot (BHAD): At a minimum, the institutional controls and deed restrictions placed on the abandoned BHAD by the Department of Defense when the surface estate was transferred to private ownership will apply within the BHAD. Other restrictions or closures for the BHAD and the Igloo town site are described under each alternative. Within the limits of BLM's authority, Mitigation, BMPs Guidelines and SOPs (**Appendix J**) will be applied to locatable mineral development.

MD-23 Waste water from coal mining: Waste water from coal bed mining operations will not be disposed by spreading onto the ground surface unless the water meets the minimum State water quality standards.

3.2.24 Renewable Energy Resources

Goal 1: *Make lands available for renewable energy development, consistent with goals to manage other resources.*

Goal 2: *Provide opportunities for renewable energy development, especially for wind energy, while avoiding or minimizing adverse impacts on wildlife, cultural, visual, and other resource values.*

Goal 3: *Restore areas to near natural conditions when renewable energy development is decommissioned.*

Management Decisions

MD-1: In the Planning Area 19,903 acres (7% of BLM surface estate in western South Dakota) will be open to renewable energy development. These areas will be managed as Potential Wind Development Areas. At the discretion of the AO, lands designated as Potential Wind Development Areas could be offered for competitive leasing. BLM will manage 69,811 acres of the open area as Potential Wind Development Areas. Approximately 107,147 acres will be renewable energy ROWs avoidance areas. Approximately 146,240 acres will be renewable energy ROW exclusion areas. Refer to **Appendix A1**, Figure 2-8 and Map G in **Appendix A2**.

MD-2: The Fort Meade and Fossil Cycad ACECs, the Exemption Area, VRM Class II areas, Greater Sage-Grouse PHMA, within 1 mi of leks in GHMA, areas near raptor nests and sharp-tailed grouse leks, greater prairie-chicken leks and wintering areas for sage-grouse will be Renewable Energy ROWs exclusion areas. Other important wildlife and special status species habitat, other portions of GHMA, floodplains, and soils that are vulnerable to impacts will be ROWs avoidance areas. VRM Classes III and IV will be open to Renewable Energy ROWs. Refer to summary **Table 3-4** below:

Table 3-4
Summary of Renewable ROW Restrictions

Resource	Restriction
Fort Meade ACEC/SRMA +buffer	Exclusion
Fossil Cycad ACEC	Exclusion
Exemption Area SRMA +buffer	Exclusion
Sage-grouse PHMA	Exclusion

Table 3-4
Summary of Renewable ROW Restrictions

Resource	Restriction
Greater Sage-Grouse GHMA/lek buffers	Exclude 1m lek Avoidance for the rest
Big game wintering Areas	Avoidance
Greater Sage-Grouse wintering areas	Exclusion
Sharp-tailed grouse/ greater prairie-chicken lek buffers	Avoidance
Prairie dog habitat	Avoidance
Colonial-nesting water birds	Exclusion
Black-footed ferret Habitat	Exclusion
Pallid/SN Sturgeon	Avoidance
Sprague's Pipit	Avoidance
All Raptor nests	Exclusion
Bighorn sheep range	Avoidance
Least terns/piping plover habitat	Avoidance
Fisheries	Avoidance
VRM Class II	Exclusion
VRM Class III & IV	Open
Streams, water bodies, floodplains, wetlands & riparian	Avoidance
Sensitive soils (including steep slopes)	Avoidance
Badland/Rock outcrop	Avoidance

Appendix R and Appendix S provide a more detailed summary of renewable ROW restrictions.

MD-3: BLM will require applicants to complete multi-year preconstruction studies to confirm migration, wintering or breeding season concentrations of raptors and other wildlife in proposed renewable energy development areas.

MD-4: BLM will consider proposals for renewable energy development such as wind, biomass, and solar, except where otherwise restricted.

MD-5: This Plan adopts the BMPs provided in the Wind Energy Programmatic EIS (BLM 2005b) for the planning area, and follow directives on renewable energy development as outlined in BLM policy and guidance.

MD-6: BLM will develop mitigation measures at the project level based on current science.

MD-7: Use of other restrictions and practices: Fluid Mineral Stipulations, COAs and Lease notices, BMPs and Guidelines for other uses (**Appendix G and J**) may be applied to Renewable Energy actions when applicable and necessary to limit impacts or conflicts to resources or resource uses. Application of these stipulations would be determined through implementation level (project level) planning.

3.2.25 Special Designations

MD-1: Stipulation: Surface occupancy and use is prohibited within the National Trail Management Corridor of the designated Lewis and Clark National Historic Trail along the Missouri River. The River Corridor is the designated historic trail for the Lewis and Clark Trail. To protect the Lewis and Clark

Trail and associated settings, this stipulation will be applied to the water portion of the Missouri River and its reservoirs and extend out ½ mile from the high water mark of the River and its reservoirs.

Fort Meade Recreational Areas ACEC (Special Designation)

Goals:

- *Fort Meade ACEC will be managed for Front Country recreation setting characteristics.*
- *Maintain or enhance PFC of Bear Butte Creek and the associated riparian zone.*
- *Provide for a diversity of vegetation types across the landscapes including healthy functioning riparian areas, woody draws, pine forests and grasslands.*
- *Perennial grasses make up at least 60% of the vegetative cover in the mid grass association.*
- *Ensure that adequate food and cover would be available for wildlife before, during and after livestock use.*

Management Decisions

MD-1: Vegetative management practices will include Rx fire, IPM, and grazing to maintain health and productivity of native plant species recognizing that some non-native species such as smooth brome and Kentucky bluegrass have become too well established to eradicate unless new technology or methods are developed.

MD-2: Revise the current NRHP Nomination for the Fort Meade Historic District site boundary to incorporate all additional acres, approximately 3,370 acres, inside the original Military Reservation that are administered by the BLM. Consider a NHL nomination, contingent on other partnering agency cooperation.

MD-3: Completion of the VRM designation on Fort Meade ACEC will result in the following VRM Classification approximate acres:

**Table 3-5
Fort Meade ACEC VRM Classification**

VRM Class	Acres
I	0
II	1,231
III	5,284
IV	218
0 (No Designation)	0

MD-4: Forest and Woodland Products will be treated the same as the rest of the planning area except no new permanent roads will be allowed. Resource use restrictions for other portions of the planning area will apply unless otherwise restricted (refer to Planning Areas Management Decisions of Section 3 of the ARMP). Rerouting and maintenance of existing authorized roads may be allowed to reduce impacts on resources. Temporary roads will be allowed after project level planning, and decommissioned as part of the project.

MD-5: Incidental use of plant materials will be allowed, except that only above ground plant gathering will be allowed in the Fort Meade ACEC. Refer to glossary for incidental and casual use definitions).

- Grazing Objectives for Fort Meade ACEC include: Maintain or enhance PFC of Bear Butte Creek and the associated riparian zone.
- Provide for a diversity of vegetation types across the landscapes including healthy functioning riparian areas, woody draws, pine forests, hardwoods, and grasslands.
- Perennial grasses make up at least 60% of the vegetative cover in the mid grass association.
- Ensure that adequate food and cover would be available for wildlife before, during and after livestock use.

MD-6: A bid process will continue to be conducted to establish vegetative grazing use contracts for the Fort Meade and the Bear Butte Allotments (Per 43 CFR, Part 4110.1-1 and previous use administered by the Veterans Administration at time of acquisition). The Westside Pasture Allotment(s) could be separated from the Bear Butte Allotment and managed under a Section 15 grazing lease(s). Billing for the Westside Pasture Allotment(s) will be conducted in a manner consistent with all other Section 15 grazing leases.

MD-7: The competitive bid process that is used for Fort Meade may be used for the East Pastures (South Dakota State University Pastures) if the current R&PP lease expires or is terminated, otherwise the authorization will remain under an R&PP lease.

MD-8: Up to 170 acres of public land will be considered for transfer to the Black Hills National Cemetery. There will be 17 to 27 AUMs removed from the Fort Meade Allotment if the transfer was completed. Actual AUMs affected may change depending on actual acres transferred or additional carrying capacity studies.

MD-9: Grazing is allowed in Camp Fechner and the Muzzleloader exclosures on an annual basis to reduce the buildup of fine fuels. Periodic grazing of other exclosures may be allowed depending on the purpose of the exclosure. If allowed in other exclosures, grazing will be used only for management of fuels, other resource benefits, or research.

MD-10: Maintain adequate residual cover to support hydrologic function based on current growth of key native plant species.

MD-11: Livestock use dates may vary based on actual conditions but will normally occur from May 15 to Oct. 31 for the Bear Butte Allotment and from June 15 to Oct. 31 for the Fort Meade Allotment.

MD-12: Fort Meade ACEC will be designated a SRMA, and will continue as an ACEC.

MD-13: Fort Meade ACEC will be managed for Front Country recreation setting characteristics.

MD-14:

- Camping stay limits will be consistent with current BLM policy, and allowed in designated campgrounds: Alkali Creek Trailhead Campground; Alkali Creek Horse Camp; Fort Meade Reservoir, if it is developed.

- Motorized travel cross country will not be allowed.
- Campfires will be allowed only in established fire pits or grates at designated sites. Additional use restrictions will be implemented under extreme fire conditions.

MD-15:

- Fort Meade Recreational Area ACEC will be managed the same as rest of the planning area except only non-motorized travel will be allowed on existing trails, and snowmobiling will be prohibited.
- Approximately 9 miles of the Centennial Trail will be on BLM-administered lands.
- Routing and maintenance of the Centennial Trail will be coordinated with the Forest Service, the lead agency for the trail.
- Additional local trails may be developed.
- Maintenance of existing trails (Nature Trail, Longstone Building Trail, VFW Chapel Trail, Centennial Trail) will be allowed.

MD-16:

- Hunting and use of firearms will be managed the same as the rest of the planning area except hunting with firearms or shooting of firearms will be prohibited on certain portions of Fort Meade ACEC (Figure 3-3 in this section).
- Pneumatic devices such as pellet guns or air rifles will not be allowed unless authorized in writing
- New permanent target shooting ranges will not be allowed. Target shooting ranges will be allowed in the existing muzzleloader range only, utilizing black powder firearms with the following exceptions: Applications for temporary firearm or archery use for education purposes will be considered in areas adjacent to or near the existing muzzleloader range (within the fenced enclosure north of highway 34), if such use is not in conflict with other uses that are authorized at the time of application.
- Traps or snares will not be allowed unless authorized in writing for such purposes as research or problem animal removal.

MD-17: Incidental use of above ground plant materials is allowed but may be restricted or closed if adverse impacts or repeated conflicts with other users occur.

MD-18: Motorized travel will be limited to designated routes except for administrative, authorized or emergency use. Temporary road construction will be allowed and decommissioned as part of the project.

MD-19: Snowmobiles or vehicles specifically equipped to travel over snow will not be allowed except for emergency or administrative use.

MD-20: The existing Old Hooper Dairy Road will be authorized as a new ROW.

MD-21: Construction of new permanent roads is not allowed except for rerouting of existing authorized roads to reduce impacts on resources. Temporary road construction and decommissioning will be allowed on a project specific basis.

MD-22: Establish and maintain a system of marked equestrian, hiking and biking trails. Partnerships with user groups will be the preferred method for planning, establishment, and maintenance. New trail establishment will be allowed.

MD-23: New R&PP leases could be allowed provided they are compatible with the objectives in the Fort Meade ACEC management plan.

MD-24: Unauthorized use, occupancy and development of public lands will be investigated and resolved either through termination and removal of facilities or issuance of an authorization where it is compatible with the objectives of the Fort Meade ACEC management plan. Disposal is not an option.

MD-25: New permanent target shooting ranges will not be allowed. Target shooting ranges will be allowed in the existing muzzleloader range only, utilizing muzzle loading black powder firearms with the following exceptions: Applications for temporary firearm or archery use for education purposes will be considered in areas adjacent to or near the existing muzzleloader range (within the fenced enclosure north of highway 34), if such use is not in conflict with other uses that are authorized at the time of application.

MD-26: BLM will allow military exercises that are compatible with the objectives of the Fort Meade ACEC management plan.

MD-27: The Fort Meade ACEC will be a ROW exclusion area except for Hooper Dairy Road and all other valid existing rights and designated corridors as designated in the Fort Meade ACEC management plan of 1996 as shown in Figure 3-3 in this section.

MD-28: Within the designated Fort Meade ROW corridor, all power/utility lines that can be safely buried will be buried provided that the burial of lines does not conflict with other resource values. Refer to Figure 3 for a display of the Fort Meade ROW corridor.

MD-29: Fort Meade ACEC will be an exclusion area for power/utility lines except for the designated corridor (See Figure 3-3). Refer to management decision 28 regarding burial of lines in the designated corridor

MD-30: Construction of new roads is not allowed except for rerouting of existing authorized roads to reduce impacts on resources and address safety issues.

MD-31: When opportunities exist, BLM will consider acquisition of land adjacent or near Fort Meade ACEC to protect or enhance cultural, historic values, and other resource values such as recreation and wildlife.

MD-32: BLM may transfer of up to 170 acres of BLM-administered lands to the Black Hills National Cemetery may be allowed, provided that impacts are minimal and the transfer is consistent with

management goals and objectives. If the proposed transfer does not occur the land will remain part of the ACEC.

MD-33: Up to six acres of BLM-administered land in the Fort Meade ACEC (lands adjacent to the sewer lagoons) will be considered for transfer to the City of Sturgis pending additional further environmental review.

MD-34: Fort Meade ACEC will be recommended for withdrawal from locatable mineral entry. Closed to leasable mineral and salable mineral exploration and development.

MD-35: The Fort Meade Recreation Area will be a ROW Exclusion area for renewable energy projects unless the project is deemed necessary for the management of the Fort Meade ACEC.

MD-36: Transfer of up to 170 acres of BLM-administered lands to the Black Hills National Cemetery may be allowed, provided that impacts are minimal and the transfer is consistent with management goals and objectives. If the proposed transfer does not occur the land will remain part of the ACEC.

MD-37: Revise the current NRHP Nomination for the Fort Meade Historic District site boundary to incorporate all additional acres, approximately 3,370 acres, inside the original Military Reservation that are administered by the BLM. Consider a NHL nomination, contingent on other partnering agency cooperation.

MD-38: Fort Meade ACEC will continue to be designated as an ACEC for historical and archaeological relevance and importance.

MD-39: Fort Meade ACEC will be designated as TMAs.

MD-40: Motorized travel will be limited to designated routes except for administrative, authorized or emergency use.

MD-41: Off road travel for game retrieval will not be allowed, exceptions will require written approval by the Field Manager.

MD-42: Back Country Byway designation and management will continue as detailed in the 1996 Ft. Meade ACEC Management Plan.

MD-43: Designated transportation /utility corridors will be located along I-90, State Highway 34 and the Bear Butte Road as described in the 1996 Fort Meade ACEC Plan Figure 3-3.

MD-44: Temporary travel restrictions will be implemented in emergency situations to comply with fire restrictions or protect the soil and water quality

MD-45: Travel routes through cultural resource sites will be rerouted or mitigated.

MD-46: Lands within the Fort Meade ACEC will not be considered for disposal except 5.83 acres of the SDM 74900.

MD-47: Recreational gold panning will be prohibited.

MD-48: Camping will be prohibited outside designated campgrounds.

MD-49: Recreation Use Permits (RUPs) will be required at designated campgrounds. SRUPs will be authorized where consistent with National BLM SRP policy.

MD-50: The BLM will continue management of Fort Meade according to the goals and objectives of the 1987 CRMP and the 1996 Fort Meade Recreation Area ACEC Management Plan. This includes Management Objectives such as: (1) Inventory and evaluate sites/features on public lands to determine their best use, (2) Protect significant sites/features, and (3) Insure their proper use.

MD-51: A minimum of 8 to 12 inches of residual herbaceous growth will be maintained on 50 percent of the uplands needed for nesting by ground-nesting birds, particularly sharp-tailed grouse and waterfowl.

3.2.26 Fossil Cycad ACEC (Special Designation)

***Goal 1:** Protect relevant and important values through ACEC designation (Refer to Appendix T in the Proposed South Dakota RMP and Final EIS (BLM 2015) and apply special management where standard or routine management is not adequate to protect the areas from risks or threats of damage/degradation or to provide for public safety from natural hazards. A map of the Fort Meade ACEC is shown in Figure 3-3 of this plan.*

***Goal 2:** Paleontological resources are preserved. Sites are interpreted for vulnerability to degradation.*

Management Decisions

MD-1: Incidental use of plant materials will be allowed, except that only above ground plant gathering will be allowed in the Fossil Cycad ACEC.

MD-2: Fossil Cycad will be managed as VRM Class II.

MD-3: The Fossil Cycad ACEC will be an exclusion area for renewable energy development, including testing and monitoring.

MD-4: Locatable federal minerals under Fossil Cycad ACEC will be recommended for withdrawal, while leasable federal minerals and salable federal minerals will be closed (no lease).

MD-5: Fossil Cycad will be managed as a ROWs avoidance area for general ROWs. A new ROW or modification of the existing ROW associated with vehicle travel or highway/bridge construction on US Highway 18 may be allowed at BLM's discretion. Other forms of general ROWs not associated with vehicle travel on Highway 18, or construction of Highway 18 will not be allowed in the Fossil Cycad ACEC.

Prior to approving a ROW action for US Highway 18, the project proponent must clearly demonstrate that cultural, paleontological and other high value resources would not be adversely impacted. If resources are likely to be adversely impacted, BLM shall require the project proponent to complete mitigation and recovery of specimens and all scientific data, as well as specimen curation, and other forms of mitigation as described for each program area in the ARMP.

Fossil Cycad ACEC will be an exclusion area for renewable energy ROWs (refer to MA-3).

MD-6: Fossil Cycad will be retained in public ownership (land retention category 1). Refer to **Appendix N** for retention categories.

MD-7: All 320 acres within the current ACEC boundary will continue to be managed as an ACEC.

MD-8: Sale of forest products will not be allowed.

MD-9: Casual or commercial collection of invertebrate, vertebrate and plant fossils will not be allowed at the Fossil Cycad ACEC (refer to glossary for definition of casual collection).

MD-10: Scientific collection of invertebrate, vertebrate and plant fossils may be allowed on a case-by-case basis through a permit.

3.2.27 Social and Economic

Goal 1: *Provide opportunities for economic sustainability at the national, regional and local level.*

Goal 2: *Provide for a diverse array of opportunities that result in social benefits for local residents, businesses, recreationists, visitors, interested citizens and future generations, while minimizing the negative social effects.*

Management Decisions

MD-1: At the implementation level, BLM will evaluate projects or direction for potential disproportionate negative impacts on minority or low income populations per EO 12898, Environmental Justice. If negative disproportionate effects are identified, BLM will remediate these effects to the extent possible by identifying mitigation to be added to the alternatives of implementation level (project level) environmental review where the effects are found.

3.2.28 Public Safety

Abandoned Mine Lands (AML)

Goal 1: *Reclaim AML sites on public land to improve water quality, plant communities, and diverse fish and wildlife habitat.*

Goal 2: *Reduce and/or eliminate risks to human health from hazardous mine openings and other physical and chemical safety hazards.*

Goal 3: *Protect historic resources and wildlife habitat commonly associated with AML sites.*

Goal 4: *Remove the greatest risks, preserve bat habitat, restore the environment, and preserve representative or significant cultural resources.*

Management Decisions

MD-1: To the extent possible on BLM lands, BLM will strive to meet state and federal water quality standards in watersheds impacted by historic mining.

MD-2: BLM will assess level of risks at AML sites and prioritize for reclamation based on standardized risk assessment. Reclamation will be implemented at the highest risk sites first.

MD-3: Where deemed appropriate by BLM personnel, BLM will restore severely impacted soils and watersheds as close as possible to pre-disturbed conditions that support productive plant communities and ensure properly functioning watersheds.

MD-4: Closures of dangerous inactive and abandoned mine sites will be designed to reduce to the risks to human health and safety, restore the environment, preserve bat habitat, and protect some mine sites as cultural resources and meet or move toward meeting Land Health Standards (**Appendix J**).

MD-5: Restoration and reclamation activities and repositories will be monitored to determine effectiveness of reclamation practices. Repositories of contaminated materials will be maintained to assure cap integrity, including maintaining vegetation for stability while preventing tree growth to avoid root penetration of the cap.

3.2.29 Public Safety: Hazardous Materials

Goal 1: *Mitigate threats and reduce risks to the public and environment from hazardous materials.*

Goal 2: *Healthy public lands.*

Management Decisions

MD-1: Surface disturbing and disruptive activities will not be allowed on Air Force abandoned Minuteman missile sites and areas within 1/8 mile of the sites. Surface-disturbing activity will be restricted on the Minuteman sites. Subsurface activity will be prohibited under the sites. Proposals for surface disturbance will be assessed on a case-by-case basis. This stipulation can be excepted by the AO if it is determined that the disturbance will not intercept and contribute to the spreading of potential residual wastes by a plan that addresses the design of the proposal, stockpiling and respreading of soil materials, and sampling and testing.

O&G – CSU; Surface-disturbing activity at U.S. Air Force abandoned Minuteman missile sites will be restricted on the sites and approximately 1/8 mile (approximately 200 meters) beyond the sites. Subsurface activity will be prohibited under the sites and approximately 1/8 mile (approximately 200 meters) beyond the sites.

MD-2: Surface disturbing and disruptive activities related to locatable mineral exploration or development will not be allowed in the BHAD unless adequate mitigation measures and conservation actions are provided and the goals of this plan not compromised.

O&G – Closed: BHAD will be closed to oil and gas leasing and salable minerals due to public safety concerns. Open to locatable mineral development.

MD-3: Disposal of hazardous materials on public lands will generally not be permitted. When the use or storage of hazardous materials is authorized (i.e., in mining operations, pesticide application or other types of commercial activities) special stipulations will be applied to comply with appropriate laws, regulations, and policies. In the event of hazardous materials incidents on public land, SOPs will be used to respond. Cleanups and reclamation will be conducted in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan and the NEPA or Removal Site Evaluation (RSE) / Engineering Evaluation/Cost Analysis (EE/CA) decision.

MD-4: BLM will promote and support the appropriate use and recycling of hazardous materials in public facilities and on public land to prevent or minimize the generation and disposal of hazardous wastes.

MD-5: Environmental Site Assessments will be conducted for land acquisitions, land disposals, and for ROWs if applicable. Land uses will be authorized and managed to reduce the occurrence and severity of hazardous materials incidences on public land.

MD-6: BLM, in cooperation with other agencies and stakeholders will assess the level of risk at hazard sites and conduct remediation at highest priority sites if these sites pose a threat to the public and environment. In areas with known or potential hazardous waste or materials, BLM may defer oil and gas exploration and will not consider proposals to explore or develop other minerals until such time as the risks of these types of activities are fully known. Remedial action will be required as necessary, subject to existing State and Federal laws and requirements prior to proceeding with a project.

MD-7: BLM may prohibit or limit activities in any area that is found to contain or potentially contain hazardous materials.

MD-8: The management boundaries shown in Figure 3-1 will use the existing boundary fences of the abandoned BHAD complex. Management boundaries used to identify closure lands can be modified pending a clearance of public safety concerns in cooperation with Federal, State, and local government.

3.2.30 Public Safety: Debris Flows

Goal 1: *Prevent debris flows on public lands from occurring if possible.*

Goal 2: *Reduce risks from debris flows from public lands.*

Goal 3: *Protect the public from debris flows on public land.*

Goal 4: *No reasonably preventable debris flow potential caused by management or lack of management.*

Management Decisions

MD-1: BLM will take action to prevent/mitigate debris flows with available tools (such as Burned Area Emergency Rehabilitation (BAER) teams), and protect the public, if imminent dangers are discovered on public lands.

MD-2: Fluid Mineral Stipulations and BMPs and Guidelines (Appendix G and J) may be applied to Public Safety actions when applicable and necessary to limit impacts or conflicts to resources or resource uses. Application of these stipulations would be determined through implementation level (project level) planning.

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CHAPTER 4

CONSULTATION, COORDINATION, AND PUBLIC INVOLVEMENT

An interdisciplinary team of resource specialists from the SDFO in Belle Fourche, South Dakota, and the Montana/Dakotas State Office in Billings prepared the South Dakota ARMP. Technical review and support were provided by cooperators and the State of South Dakota.

4.1 CONSULTATION AND COORDINATION

Butte, Harding, and Meade Counties and the State of South Dakota participated as cooperating agencies in developing the ARMP. The Dakota RAC also participated, and a discussion of their involvement is included later in this chapter. Custer, Lawrence, and Pennington Counties signed on as cooperating agencies. They were invited to cooperating agency meetings but did not attend on a regular basis.

Members of the planning team have consulted formally and informally with numerous agencies, groups, and individuals during the preparation of this document. Consultation, coordination, and public involvement occurred as a result of scoping meetings, briefings, and meetings with federal, state, tribal, and local government representatives, informal meetings, and individual contacts.

To prepare this ARMP, the BLM consulted and coordinated with the USFWS, SHPO, EPA, Forest Service, USDA, and NPS. It also consulted and coordinated with the following tribes:

- Pine Ridge Sioux
- Three Affiliated Tribes (Mandan-Hidatsa-Arikara)
- Crow Creek Sioux
- Rosebud Sioux
- Standing Rock Sioux
- Cheyenne River Sioux
- Santee Sioux
- Lower Brule Sioux

- Northern Cheyenne
- Sisseton-Wahpeton Sioux

The BLM Montana/Dakotas invited the South Dakota SHPOs and tribes to participate in the preparation of the ARMP regarding the land use planning decisions included in the South Dakota planning area. The BLM sought information about historic properties, in consideration of land use planning decisions included in this ARMP and in accordance with the National Programmatic Agreement between the BLM, Advisory Council on Historic Preservation, and National Conference of State Historic Preservation Officers and the State Protocol Agreement between the BLM and SHPO, or where applicable the Section 106 regulations.

The BLM incorporated the information it received from SHPOs and tribes into the Proposed RMP and considered such information in making the land use plan decisions. The BLM has met its obligations under Section 106 of the NHPA, 54 USC, Section 306108, as outlined in the National Programmatic Agreement and the state protocols or where applicable under the Section 106 regulations. The BLM will satisfy the requirements of NHPA Section 106 for future implementation-level decisions, such as project proposals, including adequate consultation with SHPO, THPO, Native American tribes, and other interested parties, consistent with the alternative procedures set forth in the National Programmatic Agreement and relevant state protocol or, where applicable, the Section 106 regulations.

The South Dakota SHPO worked with other state agencies as a formal cooperating agency for planning.

4.2 PUBLIC INVOLVEMENT

A notice of intent (NOI) to prepare the Draft RMP/Final EIS was published in the *Federal Register* on July 19, 2007. This notice served as the beginning of the BLM's formal scoping process. The BLM distributed press releases and public service announcements to South Dakota newspapers and television and radio stations and prepared outreach materials, including fact sheets and informational flyers to distribute at meetings and in communities. The outreach materials provided an overview of the planning process and the importance of BLM-administered lands and mineral estate in South Dakota. The BLM hosted nine scoping open house meetings from August to October 2007.

The SDFO received 24 written submittals as a result of scoping. All those who submitted indicated an interest in BLM-administered land and resource management. Many of those who submitted offered substantive comments, while others conveyed a desire or an opinion. The BLM's resource specialists analyzed and considered 370 individual comments.

The BLM published the notice of availability (NOA) for the South Dakota Draft RMP and EIS for public review and comment in the *Federal Register* on June 14, 2013. This initiated the 90-day public comment period for this document. During this comment period, the BLM held public meetings in Belle Fourche, Buffalo, Pierre, Rapid City, and Sturgis. It received 48 comment letters, forms, and e-mails during the 90-day comment period. These documents contained 322 substantive comments.

The BLM received comment letters by mail, e-mail, fax, and delivered by hand. The comments covered a wide spectrum of thoughts, ideas, opinions, and concerns. According to NEPA, the BLM is required to identify and formally respond to all substantive public comments. It coded substantive comments from

each submission to appropriate categories, based on content of the comments. The categories generally follow the sections presented in the Draft RMP, although some relate to the planning process.

Although all comments were considered, the comment analysis process involves determining whether a comment is substantive or not. In performing the analysis, the BLM relied on the CEQ's regulations to determine what constitutes a substantive comment.

The comments received on the Draft RMP did not differ significantly from issues raised during public scoping. In some cases, commenters disagreed with the actions proposed in the Preferred Alternative to address issues or to achieve goals. In these cases the Alternatives were reviewed and changes were made when appropriate. The changes made between Draft and Proposed RMP/Final EIS were summarized and placed in Chapter I of the Proposed RMP/Final EIS when it was published on May 29, 2015.

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CHAPTER 5

PLAN IMPLEMENTATION

5.1 IMPLEMENTING THE PLAN

Implementation, after a BLM RMP is approved, is a continuous and active process. Management decisions can be characterized as immediate or one-time future decisions.

Immediate decisions—These are the land use planning decisions that go into effect when the ROD is signed. They include goals, objectives, allowable uses, and management direction, such as the allocation of lands as open or closed for salable mineral sales, lands open with stipulations for oil and gas leasing, and areas designated for OHV use. These decisions require no additional analysis and guide future land management actions and subsequent site-specific implementation decisions in the planning area. Proposals for future actions, such as oil and gas leasing, land adjustments, and other allocation-based actions will be reviewed against these plan decisions to determine if the proposal conforms with the plan.

One-time future decisions—These types of decisions are those that are not implemented until additional decision-making and site-specific analysis is completed. Examples are implementation of the recommendations to withdraw lands from locatable mineral entry or development of travel management plans. Future one-time decisions require additional analysis and decision-making and are prioritized as part of the BLM budget process. Priorities for implementing one-time RMP decisions will be based on the following criteria:

- Current and projected resource needs and demands
- National BLM management direction
- Available resources

General implementation schedule of one-time decisions—Future decisions discussed in this ARMP will be implemented over a period of years, depending on budget and staff availability. After issuing the ROD, the BLM will prepare implementation plans that establish tentative time frames for completing one-time decisions identified in the ARMP. These actions require additional site-specific decision-making and analysis.

This schedule will assist BLM managers and staff in preparing budget requests and in scheduling work. However, the proposed schedule must be considered tentative and will be affected by future funding, changing program priorities, nondiscretionary workloads, and by partner and external public cooperation. Yearly review of the plan will provide consistent tracking of accomplishments and information that can be used to develop annual budget requests to continue implementation.

5.2 MAINTAINING THE PLAN

The ARMP can be maintained as necessary to reflect minor changes in data. Plan maintenance is limited to further refining or documenting a previously approved decision incorporated in the plan or clarifying previously approved decisions.

The BLM expects that new information gathered from field inventories and assessments, research, other agency studies, and other sources will update baseline data or will support new management techniques, BMPs, and scientific principles. Where monitoring shows that land use plan actions or BMPs are not effective, the plan may be maintained or amended, as appropriate.

Plan maintenance will be documented in supporting records; it does not require formal public involvement, interagency coordination, or the NEPA analysis required for making new land use plan decisions.

5.3 CHANGING THE PLAN

The ARMP may be changed, should conditions warrant, through a plan amendment or revision process. A plan amendment may become necessary if major changes are needed or to consider a proposal or action that is not in conformance with the plan. Monitoring, evaluating new data, making policy changes, or changing public needs might also provide a need to amend the plan. If several areas of the plan become outdated or otherwise obsolete, it also might require a plan revision. Plans are amended and revised with public input and the appropriate level of environmental analysis conducted according to the Council on Environmental Quality (CEQ) procedures for implementation of NEPA.

New information may lead to changes in resource inventories. New use areas and resource locations may be identified or use areas and resource locations that are no longer valid may be identified. These resources usually cover small areas requiring the same protection or mitigation as identified in this plan. Identifying new areas or removing old areas that no longer have those resource values would not require a plan amendment or revision.

5.4 PLAN EVALUATION, ADAPTIVE MANAGEMENT, AND MONITORING

Evaluation is a process by which the plan and monitoring data are reviewed to see if management goals and objectives are being met and if management direction is sound. Land use plan evaluations determine if decisions are being implemented, if mitigation measures are satisfactory, if there are significant changes in the related plans of other entities, if there is new data of significance to the plan, and if decisions should be changed through amendment or revision. Monitoring data gathered over time is examined and used to draw conclusions on whether management actions are meeting stated objectives, and if not, why not. Conclusions are then used to make recommendations on whether to continue current management or to identify what changes need to be made in management practices to meet objectives.

The BLM will use land use plan evaluations to determine if the decisions in the ARMP, supported by the accompanying NEPA analysis, are still valid in light of new information and monitoring data. Evaluations will follow the protocols established by the BLM Land Use Planning Handbook (H-1601-1) or other appropriate guidance in effect at the time the evaluation is initiated.

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CHAPTER 6

GLOSSARY

Abandoned Mine Land Program. The BLM's program that focuses on reclaiming hard rock abandoned mine lands on or affecting public lands administered by the BLM. The primary goal of the program is to remediate and reduce actual or potential threats that pose physical safety risks and environmental degradation. The BLM applies risk-based criteria and uses the watershed approach to establish project priorities. The program also works to return mine-impacted lands to productive use.

Acquired lands. Lands acquired for BLM administration in various ways, such as the following:

- Purchased by congressionally appropriated funds
- Donated
- Exchanged
- Acquired through the Land and Water Conservation Fund
- Returned to public land status through withdrawal revocations or relinquishments
- Acquired via split-estate
- Transferred from a federal agency
- Acquired by easement
- Acquired by any other means

Activity plan. A document that describes management objectives, actions, and projects to implement decisions of the analysis of the management situation or other BLM planning documents. Usually prepared for one or more resources in a specific area. Sometimes referred to as an implementation plan or project level plan.

Adaptive management. The incorporation of new knowledge or adaptation of management resulting in the modification of plans in appropriate ways, over time. Adaptive management involves testing, monitoring, and evaluating applied strategies, incorporating new knowledge or adapting to changing circumstances based on advances in scientific knowledge, monitoring results, and the needs of society.

Additionality. The conservation benefits of compensatory mitigation that are demonstrably new and would not have resulted without the compensatory mitigation project (adapted and modified from BLM Manual Section 1794).

Avoidance mitigation. Avoiding an impact altogether by not taking a certain action or parts of an action (40 CFR, Part 1508.20[a]; e.g., may also include avoiding the impact by moving the proposed action to a different time or location).

Aggregate surfacing. The layer or layers of specified or selected material of designed thickness placed on a road sub-base or sub-grade for support.

Air quality. Depends on the quantity and type of pollutants in the atmosphere and the dispersion potential of an area to dilute those pollutants.

Air quality related value (AQRV). A resource identified by the Federal Land Management Agency for one or more federal areas that may be adversely affected by a change in air quality. The resource may include visibility or a specific scenic, cultural, physical, biological, ecological, or recreational resource identified by the Federal Land Manager for a particular area. AQRV impacts may also include sulfur, nitrogen, acid deposition, and lake acidification.

Alien species. Per Executive Order 13112 of 1999 (which established the National Invasive Species Council), alien species is, with respect to a particular ecosystem, any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem.

Allotment. An area of land where one or more operators graze their livestock. It generally consists of public lands but may include parcels of private or state-owned lands. The number of livestock and period of use are stipulated for each allotment.

Allotment management plan. A plan for managing livestock grazing on specified public land.

All-terrain vehicle (ATV). Small, three- and four-wheel recreational vehicles capable of operating in rugged terrain.

Ambient air quality. The state of the atmosphere at ground level, as defined by the range of measured or predicted ambient concentrations of all significant pollutants for all averaging periods of interest.

Ambient noise. The all-encompassing noise level associated with a given environment, being a composite of sounds from all sources.

Animal unit. An animal unit is one mature cow of approximately 1,000 pounds and a calf up to weaning, usually 6 months of age, or their equivalent, such as one horse or five sheep.

Animal Unit Month. The forage needed to support one 1,000-pound cow, one cow/calf pair, one horse, or five sheep for one month (approximately 800 pounds of forage).

Aquatic. Living or growing in or on the water.

Area of critical environmental concern. Area where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect humans from natural hazards.

Attainment area. A geographic area in which levels of a criteria air pollutant meet the health-based National Ambient Air Quality Standard for that specific pollutant.

Attribute. A discreet feature or characteristic of biotic or physical resources that can be measured (for example, plant density, which is the number of individuals or stems per unit area).

Backcountry. A recreational setting characteristics class where the character of the natural landscape and any modifications are in harmony with surroundings and are not visually obvious or evident. Developed trails are made mostly of native materials. Structures are rare and isolated. Other criteria apply as described in **Appendices L and M**.

Backcountry byways. The BLM's scenic byways program. Scenic corridors along many of the agency's roads that have significant scenic, historical, cultural, or recreational qualities. The Fort Meade ACEC Backcountry Byway, which runs from near US Interstate Highway 90 Exit 94 to State Highway 34 west of the Veterans Administration Health Center, is listed as the BLM Road on Meade County Records.

Baseline. The existing condition of a defined area or resource that can be quantified by an appropriate measurement. During environmental reviews, the baseline is considered the affected environment that exists at the time of the review's initiation and is used to compare predictions of the effects of the proposed action or a reasonable range of alternatives.

Beneficial uses. A term used in the context of water uses. Beneficial uses of all South Dakota waters include irrigation and fish and wildlife propagation, recreation, and stock watering.

Best management practices (BMPs). A suite of techniques or practices used to guide or applied to management actions to aid in achieving desired outcomes while reducing the impacts of various management actions. BMPs are often adopted or developed in conjunction with resource management plans (RMP) but are not considered an RMP decision unless the plan specifies that they are mandatory. BMPs may be updated or modified without a plan amendment if they are not mandatory.

Big game. Larger species of wildlife that are hunted, such as elk, deer, bighorn sheep, and pronghorn antelope.

Biodiversity (biological diversity). The variety of life and its processes and the interrelationships within and among various levels of ecological organization. Conservation, protection, and restoration of biological species and genetic diversity are needed to sustain the health of existing biological systems. Federal resource management agencies must examine the implications of management actions and development decisions on regional and local biodiversity.

Biological opinion. A document prepared by the US Fish and Wildlife Service staff stating their opinion as to whether a federal action will likely jeopardize the continued existence or adversely modify the habitat of a listed threatened or endangered species.

Biologically significant unit (BSU). For this plan, a BSU is the summary of all the priority habitat management areas within a GRSG population, as delineated in the COT report.

Biological treatment. The use of animals (e.g., sheep and goats) and insects to control noxious weeds.

Biomass. Trees and woody plants, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or rangeland environment, that are the byproducts of management, restoration, or hazardous fuel reduction treatment.

Buffer. A protective area next to or in an area of concern requiring special attention or protection. In contrast to riparian zones, which are ecological units, buffers can be designed to meet varying management concerns.

Burned Area Emergency Rehabilitation Program (BAER). It is designed to address the loss of vegetation, which exposes soil to erosion and may increase water runoff and cause flooding. Sediments may move downstream and damage houses or fill reservoirs and put endangered species and community water supplies at risk. The head of each BAER team is chosen by the procedures in the Incident Command System, a nationwide system that has been developed for fires and emergencies of all scales. It applies to all fires, natural disasters, hazardous material spills, and terrorist attacks. A BAER team is likely headed by a local person in a small event and is more likely to be an outside person in a large event. BAER teams are staffed by specially trained professionals: hydrologists, soil scientists, engineers, biologists, silviculturists, range conservationists, archaeologists, and others, who evaluate the burned area and prescribe treatments to protect the land quickly and effectively. BAER objectives are as follows:

- To determine if emergency resource or human health and safety conditions exist
- To alleviate emergency conditions to help stabilize soil
- To control water, sediment, and debris movement
- To prevent impairment of ecosystems
- To mitigate significant threats to health, safety, life, property, and downstream values at risk
- To monitor the implementation and effectiveness of emergency treatments

Candidate species. Any species not yet officially listed but is undergoing a status review or is proposed for listing according to *Federal Register* notices published by the Secretary of the Interior or the Secretary of Commerce.

Canopy. The part of any stand of trees represented by the tree crowns. It usually refers to the uppermost layer of foliage, but it can be used to describe lower layers in a multi-story forest.

Carbon sequestration. When carbon dioxide (CO₂) is removed from the atmosphere and stored in soils, biomass, and harvested products and is protected or preserved to avoid CO₂ release back to the atmosphere. These become carbon stores or carbon sinks.

Casual use. Any short-term noncommercial activity that does not cause appreciable damage or disturbance to the public lands, their resources, or improvements and which is not prohibited by closure

of the lands to such activities (43 CFR, Part 2920.0-5[k]; refer to *casual collection* for a definition of this term for paleontology purposes). For mining, casual use generally includes collecting geochemical, rock, soil, or mineral specimens using hand tools, hand panning, and nonmotorized sluicing. It also generally includes use of metal detectors, gold spears, and other battery-operated devices for sensing the presence of minerals, and hand and battery-operated dry washers. Casual use does not include mechanized earth-moving equipment, truck-mounted drilling equipment, suction dredges, motorized vehicles in areas designated as closed to off-road vehicles, chemicals, or explosives. It also does not include occupancy or operations where the cumulative effects of the activities result in more than negligible disturbance.

Casual collection (paleontology). Collecting a reasonable amount of common invertebrate and plant paleontological resources for noncommercial personal use, either by surface collection or the use of non-powered hand tools resulting in only negligible disturbance to the Earth's surface or other resources,

Center of the Nation. This area is proposed as one of the planning area's three designated travel management areas. It is in northern Butte and southern Harding Counties and contains the most BLM-administered lands in South Dakota. Its general boundaries are the South Dakota state line on the west, US Highway 212 in the south, Arpan Road and US Highway 85 as the east, and the Dillon and Collins Roads in Harding County on the north. The travel management area's main internal roads are Old US 85, Harding Road, Camp Crook Road, and Albion Road. Refer to **Appendix A2** Map C.

Chemical treatment. The use of pesticides and herbicides to control pests and undesirable plant species.

Climate. A range of physical processes and states (including atmospheric conditions and earth atmosphere interactions) that apply across whole landscapes and over relatively long periods, typically decades and longer.

Climax. In ecology, the stable and self-perpetuating end stage in the ecological succession or evolution of a plant and animal community.

Closed. Designated areas and trails where the use of OHVs is permanently or temporarily prohibited. Emergency use of vehicles is allowed. Use may be allowed for other reasons, but such use would be made only with the approval of the BLM Authorized Officer. For the purposes of this ARMP, a closed area is where motorized and mechanized use is prohibited in all locations at all times.

Compensatory mitigation. Compensating for the (residual) impact by replacing or providing substitute resources or environments (40 CFR, Part 1508.20).

Compensatory mitigation projects. The restoration, creation, enhancement, and preservation of impacted resources (adopted and modified from 33 CFR, Part 332), such as on-the-ground actions to improve or protect habitats (e.g., chemical vegetation treatments, land acquisitions, conservation easements; adapted and modified from BLM Manual Section 1794).

Compensatory mitigation sites: The durable areas where compensatory mitigation projects will occur (adapted and modified from BLM Manual Section 1794).

Commercial thinning. A cutting made in a forest stand to remove excess salable timber in order to meet management objectives, including habitat for wildlife, fuels management, forest health, and accelerated tree growth; reducing stocking by harvesting trees to be removed for sale or use.

Commodities. Goods and services produced by industries.

Concession leases. Authorize the operation of recreation-oriented services and facilities by the private sector on BLM-administered lands and in support of BLM recreation programs. The concessionaire is authorized through a concession lease administered on a regular basis. The lease requires the concessionaire to pay fees to the BLM in exchange for the opportunity to carry out business activity. BLM Handbook H-2930-I, Recreation Permit Administration, provides consistent and explicit direction to supplement the Recreation Permit Administration Manual 2930 and regulations set forth in 43 CFR, Part 2930.

Condition class. Fire regime condition classes are a measure describing the degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components, such as species composition, structural stage, stand age, canopy closure, and fuel loadings. One or more of the following activities may have caused this departure: fire suppression, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, or introduced insects or disease.

Condition Class 1. Fire regimes are within a historical range, and the risk of losing key ecosystem components from fire is low. Vegetation attributes (species composition and structure) are intact and functioning within a historical range.

Condition Class 2. Fire regimes have been moderately altered from their historical range. The risk of losing key ecosystem components from fire is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals (increased or decreased). This results in moderate changes to one or more of the following: fire size, frequency, intensity, severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.

Condition Class 3. Fire regimes have been altered significantly from their historical ranges. The risk of losing key ecosystem components from fire is high. Fire frequencies have departed from historical frequencies by multiple return intervals. This action results in dramatic changes to one or more of the following: fire size, frequency, intensity, severity, and landscape patterns. Vegetation attributes have been altered significantly from their historical range.

Condition of Approval (COA). A site-specific and enforceable requirement included in an approved application for permit to drill or sundry notice that may limit or amend the specific actions proposed by the operator. COAs minimize, mitigate, or prevent impacts on resource values or other uses of public lands.

Condition survey. An inspection of a facility that identifies and documents conditions, deficiencies, and physical problems using established maintenance condition standards as a reference.

Conifer. A tree that bears cones and evergreen needle-like or scale-like leaves. Its families include pine, juniper, and spruce.

Controlled surface use (CSU). Use or occupancy is allowed (unless restricted by another stipulation), but identified values or resources present require special operational constraints that may require modification of activities and uses. CSUs are not used as a substitute for the no surface occupancy or timing stipulations.

Corrective maintenance. Maintenance that is not routine and is considered to be a one-time only cost.

Criteria pollutant. The US EPA uses six criteria pollutants as indicators of air quality and has established for each of them a maximum concentration above which adverse effects on human health may occur. The threshold concentrations are called National Ambient Air Quality Standards. The criteria pollutants are ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead.

Crucial winter range. Those areas that contain key cover, forage, topographical features, or other resources that are important to the survival of wildlife during winter.

Cultural resources. Locations of human activity, occupation, or use. Cultural resources are archaeological, historic, or architectural sites, structures, or places with important public and scientific uses and locations of traditional cultural or religious importance to specific social or cultural groups.

Cultural resources inventory. An inventory to assess the potential presence of cultural resources. There are three classes of surveys, as follows:

Class I. An existing data survey. This is an inventory of a study area that provides a narrative overview of cultural resources by using existing information to compile existing cultural resources site record data. The data are then used to base the development of the BLM's site record system.

Class II. A sampling field inventory designed to locate, from surface and exposed profile indications, all cultural resource sites within a portion of an area so that an estimate can be made of the cultural resources for the entire area.

Class III. An intensive field inventory designed to locate, from surface and exposed profile indications, all cultural resource sites in an area. On completion, no further cultural resources inventory work is normally needed.

Cumulative effects. The direct and indirect effects of a proposed project alternative's incremental impacts when they are added to other past, present, and reasonably foreseeable actions, regardless of who carries out the action.

Decision area. For purposes of this ARMP, all public land managed by the BLM within the planning area (both surface and mineral estate).

Design narrative. A detailed description of the project to be designed, the extent of required services, and a preliminary cost estimate.

Design value. A statistic that describes the air quality status of a given location relative to the level of the National Ambient Air Quality Standards (NAAQS). Design values are defined to be consistent with the individual NAAQS in terms of their averaging times and their statistical formats.

Density. The size of the population in relation to some unit of space.

Desired future condition (DFC). The condition of rangeland resources on a landscape scale that meet management objectives. The DFC is based on ecological, social, and economic considerations during the land planning process. It is usually expressed as ecological status or management status of vegetation (species composition, habitat diversity, and age and size class of species) and desired soil qualities (soil cover, erosion, and compaction).

Desired plant community. One of several plant community types that may occupy an ecological site, the one or combination that meets the minimum quality criteria for the soil, water, air, plant and animal resources, and that meets the landowner's or manager's objectives.

Diameter at breast height. The diameter of a tree taken at 4.5 feet above ground level and expressed in inches.

Disruptive activities. Those resource uses and activities that are likely to alter the behavior of, displace, or cause excessive stress to wildlife populations occurring at a specific location and time. In this context, disruptive activities refers to those actions that alter behavior or displace wildlife such that reproductive success is negatively affected or the physiological ability to cope with environmental stress is compromised. This term does not apply to the physical disturbance of the land surface, vegetation, or features. Examples of disruptive activities are fence construction, noise, vehicle traffic, or other human presence regardless of the activity. The term is used in conjunction with protecting wildlife during crucial life stages (e.g., breeding, nesting, and birthing), although it could apply to any resource value. This definition is not intended to prohibit all activities or authorized uses. For example, the following are not considered disruptive activities: emergency activities, such as fire suppression and search and rescue; rangeland monitoring; routine maintenance associated with an approved authorization; dispersed recreational activities, such as hunting and hiking; and livestock grazing.

Diversity. The relative abundance of wildlife species, plant species, communities, habitats, or habitat features per unit of area.

Drainage, surface. Runoff or surface flow of water from an area.

Durability (protective and ecological). Maintaining the effectiveness of a mitigation site and project for the duration of the associated impacts, which includes resource, administrative/legal, and financial considerations (adapted and modified from BLM Manual Section 1794).

Earnings. Wages and salaries, other labor income, and proprietor's income (including inventory valuation and capital consumption adjustments).

Easement. Right afforded a person or agency to make limited use of another's real property for access or other purposes.

Ecological site. A distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation (USDA NRCS 1997). The BLM frequently uses Field Office Technical Guides to review and use ecological site descriptions that have been developed by the Natural Resources Conservation Service to gain an understanding of the characteristics and potential of individual ecological sites. Additional information can be found at <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg>.

Ecological site inventory. The basic inventory of present and potential vegetation on BLM rangelands. Ecological sites are differentiated on the basis of the kind, proportion, or amount of plant species.

Ecological status. The present state of vegetation and soil protection of an ecological site in relation to the potential natural community for the site. Vegetation status is the expression of the relative degree of which the kinds, proportions, and amounts of plants in a community resemble that of the potential natural community. The four classes of ecological status ratings are early seral, mid-seral, late-seral, and potential natural community, with vegetation corresponding to 0-25%, 26-50%, 51-75%, and 76-100% of the potential natural community standard.

Economically/technically feasible. Actions that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant. It is the BLM's sole responsibility to determine what actions are technically and economically feasible. The BLM will consider whether implementation of a proposed action is likely, given past and current practice and technology; this consideration does not necessarily require a cost/benefit analysis or speculation about an applicant's costs and profit.

Ecosystem. An arrangement of living and non-living things and the forces that move among them. Living things are plants and animals; non-living parts of ecosystems are rocks and minerals. Weather and wildfire are two of the forces that act within ecosystems.

Ecosystem-based management. Management driven by explicit goals, executed by policies, protocols, and practices, and made adaptable by monitoring and research based on our best understanding of the ecological interactions and processes necessary to sustain ecosystem composition, structure, and function. Also, any land management system that seeks to protect viable populations of all native species, to perpetuate natural-disturbance regimes on a regional scale, to adopt a planning timeline of centuries, and to allow human use at levels that do not result in long-term ecological degradation.

Emergency stabilization and rehabilitation (ESR). Emergency stabilization actions are initiated within one year of a fire to stabilize and prevent unacceptable damage of natural and cultural resources, to minimize threats to life and property resulting from the effects of a fire, and to repair/replace/construct physical improvements necessary to prevent degradation of land or resources. Rehabilitation actions are taken within three years of the fire to repair or improve lands that are unlikely to recover to a management-approved condition and to repair or replace minor facilities damaged by fire.

Employee compensation. Wages and salaries paid to employees by industries, plus the value of benefits and any contributions to Social Security and pension funds by the employee and employer.

Encroachment. The progression of trees from forested areas into grassland or shrub land.

Endangered species. Any species that is in danger of extinction throughout all or a significant portion of its range.

Engineering Evaluation/Cost Analysis (EE/CA). Performed to evaluate alternate removal actions or expedited response actions (ERAs) in terms of their effectiveness, implementability, and cost, for cleaning up any contamination that may be found. The EPA determines the need for a response action under the removal authority, pursuant to Section 104(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (42 USC, Section 9604[a] and Section 300.415 of the National Contingency Plan, 40 CFR, Part 300). An EE/CA is prepared before such a response when it can be done as a non-time-critical removal action.

Ephemeral stream. A stream or reach of a stream that flows only in direct response to precipitation. It receives no continuous supply from melting snow or other source, and its channel is above the water table at all times.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep. Two types are defined in this plan:

Accelerated erosion. Erosion much more rapid than geologic erosion, occurring mainly as a result of human or animal activities or a catastrophe, such as fire, which exposes the surface.

Geologic erosion. Erosion caused by geologic processes acting over long geologic periods and wearing away mountains and building up such landscape features as floodplains and coastal plains; synonymous with natural erosion.

Even-aged silvicultural system. A planned sequence of treatments designed to manage a stand of trees to a single age class in which the range of tree ages in the stand is usually $\pm 20\%$ of the rotational age.

Exceedance. With respect to a National Ambient Air Quality Standard means, one occurrence of a measured or modeled concentration greater than the specified concentration level of such standard for the averaging period (1-hour, 3-hour, 8-hour, 24-hour, or annual) specified by the standard.

Exception. A one-time exemption for a particular site within the leasehold or other type of authorization. Exceptions are determined on a case-by-case basis; the stipulation continues to apply to all other sites within the leasehold. An exception is a limited type of waiver. See also *Waiver and Modification*.

Exceptional event. An event that affects air quality, is not reasonably controllable or preventable, is caused by human activity that is unlikely to recur at a particular location or a natural event, and is determined by the USEPA Administrator, in accordance with 40 CFR, Part 50.14, to be an exceptional event. It does not include stagnation of air masses or meteorological inversions, a meteorological event involving high temperatures or lack of precipitation, or air pollution relating to source noncompliance.

Exemption area. Thirty-five sections of land that are completely surrounded by National Forest System lands. This area was not included in the Black Hills National Forest because of the complicated land pattern and the many mining claim conflicts; thus, it was left under the BLM's administration. This area contains approximately 22,500 acres, approximately 5,080 acres of which are public domain. The public domain acreage consists of numerous irregular tracts that range from 0.02 acre to more than 1,200 acres. Refer to **Figure 3-2** in **Section 3**.

Existing routes. The roads, trails, or ways that are used by operators of motorized vehicles (jeeps, all-terrain vehicles, and motorized dirt bikes, for example), mechanized uses (mountain bikes, wheelbarrows, and game carts), pedestrians (hikers), and horseback riders and are, to the best of the BLM's knowledge, in existence at the time of ARMP publication.

Extended attack. A wildfire that has not been contained or controlled by initial attack forces and for which more firefighting resources are arriving or being ordered by the initial attack incident commander. Extended attack implies that the complexity level of the incident will increase beyond the capabilities of initial attack incident command.

Extensive recreation management area. An administrative unit that requires specific management consideration in order to address recreation use, demand, or recreation and visitor services program investments.

Facility (energy and mining). Human-constructed assets designed and created to serve a particular function and to afford a particular convenience or service that is affixed to specific locations, such as oil and gas well pads and associated infrastructure.

Federal Land Policy and Management Act of 1976 (FLPMA). Public Law 94-579 signed by the president on October 21, 1976. Establishes public land policy for management of lands administered by the BLM. The FLPMA specifies several key directions for the BLM, notably that management be on the basis of multiple use and sustained yield; that land use plans be prepared to guide management actions; that public lands be managed for the protection, development, and enhancement of resources; that public lands be retained in federal ownership; and that public participation be used in reaching management decisions.

Fire behavior. The manner in which a fire reacts to the influences of fuels, weather, and topography.

Fire flood (or air injection). Term used in the oil and gas industry. Fire flood works by forcing air into a well under great pressure to get it into a producing formation. The air temperature rises to the high temperature of the formations 9,000 feet below the surface and under these conditions spontaneously ignites some of the remaining oil in the formation. This increases gas pressure and heat even more and tends to move the oil as well as water from a pattern of injection wells toward a pattern of producing wells to be recovered.

Fire intensity. The product of the available heat of combustion per unit area of ground and the rate of spread of the fire. Heat energy released by the fire.

Fire management. The integration of knowledge of fire protection, prescribed fire, and fire ecology into multiple use plans, decision-making, and land management activities. Fire management places fire in perspective with overall land management objectives.

Fire management area. One or more parcels of land having a common set of fire management objectives.

Fire Management Plan (FMP). A plan that identifies and integrates all wildland fire management and related activities within the context of approved land/resource management plans. It defines a program to manage wildland fires (wildfire and prescribed fire). The plan is supplemented by operational plans, including preparedness plans, dispatch plans, prescribed fire burn plans, and prevention plans. FMPs ensure that wildland fire management goals and components are coordinated.

Fire management unit (FMU). Any land management area definable by objectives, management constraints, topographic features, access, values to be protected, political boundaries, fuel types, major fire regimes, or groups that set it apart from the management characteristics of an adjacent FMU. FMUs are scalable and cannot be separated geographically. They may have dominant management objectives and preselected strategies assigned to accomplish these objectives. The development of FMUs should avoid redundancy; each should be unique, as evidenced by management strategies, objectives, and attributes.

Fire planning unit (FPU). Describes the geographic planning area. It can include a single or multiple land use plan planning area, cross-jurisdictional boundaries, including adjacent BLM office lands, and other partner lands. A FPU consists of one or more FMUs.

Fire regime. A set of recurring conditions of fire that characterize a given fire-maintained ecosystem.

Fire Regime Condition Class (FRCC). An interagency standardized tool for determining the degree of departure from reference condition vegetation, fuels, and disturbance regimes. Helps to guide management objectives and set priorities for treatments. A federal interagency, standardized tool for determining how similar a landscape's fire regime is to its natural or historical state. FRCCs are broken down into three categories, as follows:

- FRCC 1 landscapes contain vegetation, fuels, and disturbances characteristic of the natural regime
- FRCC 2 landscapes are those that have moderately departed from the natural regime
- FRCC 3 landscapes reflect vegetation, fuels, and disturbances that are uncharacteristic of the natural regime

Classes of fire regimes are then grouped by categories of frequency (expressed as mean fire return interval) and severity. Refers specifically to five groups used in federal policy and planning: 0-35 years, low severity; 0-35 years, stand replacement; 35-100 years, mixed severity; 35-100 years, stand replacement; 200+ years, stand replacement.

Fire suppression. Any act taken to slow, stop, or extinguish a fire. Examples of suppression ARE fire line construction, backfiring, and applying water or chemical fire retardants.

Floodplain. The 100-year floodplain, as determined by the best available data. Often used as shorthand for the NSO stipulation related to riparian areas, wetlands, 100-year floodplains of rivers and streams, and water bodies. 100-year floodplains have been defined by combining the following categories of the Natural Resources Conservation Service flooded soils interpretation: very frequent, frequent, occasional, and rare (USDA NRCS 2011). These are subcategories of soils that are likely to be flooded at varying levels of frequency. The rare category represents lands subject to 1 to 5 floods in 100 years. (<http://soils.usda.gov/technical/handbook/contents/part618.html> see: 618.26). The combined flooded soils categories are a substitute for unavailable designated 100-year floodplains since it is the best available data.

Forage. All browse and herbaceous foods that are available to grazing animals.

Forage utilization. The percentage of available forage actually consumed by the domestic grazing animal based on net forage accumulation that occurs prior to and while they occupy the pasture unit.

Forest health. The condition in which forest ecosystems sustain their complexity, diversity, resiliency, and productivity, while providing for human needs and values.

Fossil. The remains or traces of an organism preserved by natural processes in the Earth's crust. This includes plants and animals, their tracks, burrows, and other imprints and are considered a non-renewable resource. It does not include minerals such as coal, oil and gas, and tar sands. Vertebrate fossils are those of animals with a spinal column; invertebrate fossils are those of organisms without a spinal column.

Front country. A recreational setting characteristics class where the character of the natural landscape is partially modified but does not overpower the natural landscape (e.g., roads, structures, and utilities). Rustic facilities such as campsites, restrooms, trailheads, and interpretive displays are present. Other criteria apply, as described in **Appendices L and M**.

Fuel. Combustible plant material, both living and dead, that is capable of burning in a wildland fire situation.

Fuel loading. The amount of fuels present expressed quantitatively in terms of weight per unit area.

Fuel type. An identification association of fuel elements of distinctive species, form, size, arrangement, or other characteristics that will cause a predictable rate of spread or resistance to control under specific weather conditions.

Fuels management. The treatment of fuels that would otherwise interfere with effective fire management or control. For instance, prescribed fire can reduce the amount of fuels that accumulate on the forest floor before the fuels become so heavy that a natural wildfire in the area would be explosive and impossible to control.

Fuels reduction. Manipulation, including combustion or removal, of fuels to reduce the likelihood of ignition or to lessen potential damage and resistance to control. Often includes thinning and prescribed burning.

Fuels treatment. The rearrangement or disposal of natural or activity fuels to reduce fire hazard.

Fugitive dust. Particulate matter suspended into the ambient air caused by man-made and natural activities, such as the movement of soil from agricultural cropland, vehicles on unpaved roadways, construction, blasting, and wind. It is not dust that is emitted from definable point sources, such as industrial smokestacks, gravel quarries, or grain mills.

Functional at risk. Riparian-wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

General habitat management areas (GHMA). Areas with or without ongoing or imminent impacts containing GRSG habitat outside the priority areas. Management decisions will maintain habitat for sustainable GRSG populations to promote movement and genetic diversity. Areas are delineated based on GRSG habitat. These areas were formerly called general habitat in the Draft South Dakota RMP/EIS.

Geocaching. An outdoor activity in which the participants use a global positioning system receiver or other navigational techniques to hide and seek containers, which usually hold a logbook.

Guidelines. See *Best management practices*.

Grazing preference. A superior or priority position against others for the purpose of receiving a grazing permit or lease. This priority is attached to base property owned or controlled by a permittee or lessee.

Grazing relinquishment. The voluntary and permanent surrender by an existing permittee or lessee (with the concurrence of any base property lienholder), of their priority (preference) to use a livestock forage allocation on public land as well as their permission to use this forage. Relinquishments do not require the BLM's consent or approval. The BLM's receipt of a relinquishment is not a decision to close areas to livestock grazing.

Grazing system. Scheduled grazing use and non-use of an allotment to reach identified goals or objectives by improving the quality and quantity of vegetation.

Groundwater (geology). Water filling all the unblocked pores of the material below the water table.

Habitat. A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

Habitat management plan (HMP). A written and approved activity plan for a geographical area that identifies habitat management activities to be implemented in achieving specific objectives of planning decisions.

Harvest efficiency. The total percent of vegetation harvested by a machine or ingested by a grazing animal, compared to the total amount of vegetation grown in the area in a given year. For continuous grazing, harvest efficiency usually averages 25 percent on rangeland.

Hazardous fuels. Combustible forest materials. Includes vegetation, such as grass, leaves, ground litter, plants, shrubs, and trees that feed a fire.

Hazardous fuels reduction. Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Hazardous material. A substance, pollutant, or contaminant that, due to its quantity, concentration, or physical or chemical characteristics, poses a potential hazard to human health and safety or to the environment if released into the workplace or the environment.

Heterogeneity. The quality or state of having dissimilar elements; having parts that are unlike or without interrelation; completely different.

High resource values. Resources that provide an important role in ecosystem function or other resource related purposes. They include special status species or rare species identified by the state and those resources that provide important aesthetic or cultural values. This term includes areas with the caliber of resources to qualify them for inclusion in SMAs, such as ACECs, NWSRs, WSAs (refer to list of acronyms at beginning of this document) and high resource areas, such as those that contain critical fish and wildlife habitat, wild horse herds, cultural sites, and threatened and endangered species habitat. Long-term retention of public lands in these SMAs is either required by law through congressional action or identified through the land use planning process.

Historic fire regime. Periodicity and pattern of naturally occurring fires in a particular area or vegetative type, described in terms of frequency, biological severity, and area of extent.

Hooper Dairy Road. Located on the Fort Meade Recreation east of the Veterans Administration complex on Highway 34. It provides access to the city of Sturgis ball diamonds and a private residence at the former Hooper Dairy. It is shown on Meade County records as Cypress Lane.

Hydric soil. A soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. One indicator of a hydric soil is a bluish/grayish soil color.

Implementation planning. NEPA planning conducted at the individual project scale for the purposes of implementing the selected alternative of the ARMP/EIS or to ensure project level requests are consistent with the direction found in the ARMP. Also referred to as project level planning.

Incidental use. Personal use of other vegetative resources on the site where they are obtained, or if they are transported to a secondary location, personal use of the resources within a reasonable period by the person obtaining them (43 CFR, Part 5400.0-5).

Initial attack. The suppression action that is carried out exclusively by the forces that are planned and used for action on initiating fires. The actions taken by the first resources on arrival at a wildfire to protect lives and property and to prevent further expansion of the fire.

Integrated pest management (IPM). An important component of proposed weed management approach for noxious weed control under all of the alternatives. IPM is defined as an effective and

environmentally sensitive approach to pest management that relies on a combination of common sense practices. This approach is intended to reduce noxious weed damage to tolerable levels by using predators, parasites, genetically resistant hosts, and environmental modifications, and when necessary and appropriate, chemical pesticides or herbicides. Treatment methods and acceptable levels of infestation are to be described in site-specific environmental analyses. An acceptable level of infestation may be incorporated into a desired plant community where total eradication is not economically or biologically reasonable.

Integrated weed management (IWM). A decision-making process that uses site-specific information to make decisions about treatment choices. IWM involves four general categories of management: cultural, biological, physical, and chemical. IWM is based on the fact that combined strategies for weed management work more effectively than a single strategy.

Interim management policy (IMP). Policy for managing public lands under wilderness review. Section 603(c) of FLPMA states “During the period of review of such areas and until Congress has determined otherwise, the Secretary shall continue to manage such lands according to his authority under this Act and other applicable law in a manner so as not to impair the suitability of such areas for preservation as wilderness, subject, however, to the continuation of existing mining and grazing uses and mineral leasing in the manner and degree in which the same was being conducted on [the date of approval of this act]: *Provided*, That, in managing the public lands the Secretary shall by regulation or otherwise take any action required to prevent unnecessary or undue degradation of the lands and their resources or to afford environmental protection.”

Intermittent stream. A stream or reach of a stream that flows for prolonged periods only when it receives groundwater discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Introduced species. A species not part of the original fauna or flora of the area in question but introduced from another geographical region through human activity. Synonymous with exotic; not synonymous with invasive species.

Invasive plants. Plants that are not part of (if exotic) or are a minor component of (if native) the original plant community or communities; have the potential to become a dominant or co-dominant species on the site if their future establishment and growth is not controlled by management or are classified as exotic or noxious plants under state or federal law. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants.

Invasive species. Invasive species are plants, animals, or pathogens that are nonnative to the ecosystem under consideration and whose introduction causes or is likely to harm the economy, the environment, or human health (Executive Order 13112).

Invertebrate. An animal lacking a backbone or spinal column.

Jurisdictional wetlands. Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions and meet the requirements of “waters of the United States.” To meet this definition three elements

are essential and made mandatory (through policy) for regulatory purposes: hydrophytic vegetation, hydric soils, and wetland hydrology. Wetlands generally include swamps, marshes, bogs, and similar areas.

Karst region. An irregular limestone region with sinks, underground streams, and caverns.

Key area. A relatively small portion of a rangeland selected, based on its location, use, or grazing value, as a monitoring site for grazing use. Key areas, when properly selected, reflect the overall acceptability of current grazing management over a pasture or area.

Lease stipulation (oil and gas). Conditions of lease issuance that protect other resource values or land uses by establishing authority for substantial delay or site changes or the denial of operations within the terms of the lease contract. The authorized officer has the authority to relocate, control timing, and impose other mitigation measures under Section 6 of the Standard Lease Form. Lease stipulations clarify the BLM's intent to protect known resources or resource values.

Leasable minerals. Those minerals or materials designated as leasable under the Mineral Leasing Act of 1920: coal, phosphate, asphalt, sulphur, potassium and sodium minerals, and oil and gas. Geothermal resources are also leasable under the Geothermal Steam Act of 1970.

Lek. For this ARMP, leks are areas used by GRSG during the mating season where males display to attract receptive females. Leks are typically used with great fidelity, for decades or longer, though they may move some over time. These sites are characterized by low vegetation with sparse shrubs, often surrounded by big sagebrush communities. Leks are considered to be the center of GRSG activities. The existence of a GRSG lek is supported by data collection, defined as a minimum of two years with two or more males lekking on-site (preferred) or one year with two or more males lekking on-site followed with evidence of lekking (vegetation trampling, feathers, and droppings) during a subsequent year. For the purpose of this ARMP, the BLM follows South Dakota Game, Fish, and Parks in recognizing leks as active or inactive.

Lentic. Pertaining to standing water, such as lakes and ponds.

Limited. Designated areas and trails where the use of OHVs is subject to restrictions, such as limiting the number or types of vehicles allowed, dates and times of use (seasonal restrictions), limiting use to existing or designated roads and trails. Under the designated roads and trails designation, use would be allowed only on roads and trails that are signed for use. Combinations of restrictions, such as limiting use to certain types of vehicles during certain times of the year, are possible. For the purposes of this ARMP, a limited area is one where motorized and mechanized travel is restricted to designated routes, unless otherwise noted. Off-road cross-country travel is prohibited in limited areas. Some routes may be closed in limited areas.

Lithic site. An archaeological site containing debris left from the manufacture, use, or maintenance of flaked stone tools.

Litter. Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer. It is composed of loose debris, including sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Locatable minerals. Minerals or materials subject to claim and development under the Mining Law of 1872, as amended. Generally includes metallic minerals, such as gold and silver, and other materials not subject to lease or sale (such as some bentonites, limestone, talc, and some zeolites). Whether a particular mineral deposit is locatable depends on such factors as quality, quantity, mineability, demand, and marketability.

Lotic. Pertaining to moving water, such as streams and rivers.

Maintenance. The work required to keep a facility (road or building) in such a condition that it may be continuously used at its original or designed capacity and efficiency and for its intended purposes.

Maintenance level. An established standard that prescribes the frequency and intensity of maintenance necessary to meet the management and use objectives of the facility.

Major ROWs. Defined as 100 kilovolts and over for transmission lines and 24 inches and over for pipelines. Guidance for this definition comes from the BLM Washington, DC, Office's consistency ADPP teams.

Management framework plan. BLM land use plan; predecessor to a resource management plan.

Map unit. The basic system of description in a soil survey and delineation on a soil map. Can vary in level of detail.

Mast. Any type of fruit or nut produced by trees or shrubs and eaten by wildlife.

Middle country. A recreational characteristic setting class where the character of the natural landscape is mostly retained. A few modifications contrast with the character of the landscape (e.g. fences and primitive roads). Facilities usually contain maintained and marked trails, simple trailhead development, and basic toilets. Other criteria apply, as shown in **Appendices L and M**.

Mineral entry. Claiming public lands (administered by the BLM) under the Mining Law of 1872 for the purpose of exploiting minerals. May also refer to mineral exploration and development under the mineral leasing laws and the Mineral Sale Act of 1947.

Mineral materials. Common varieties of such material as sand, building stone, gravel, clay, and moss rock obtainable under the Minerals Act of 1947, as amended.

Mining claim. A parcel of land that a miner takes and holds for mining purposes, having acquired the right of possession by complying with the Mining Law of 1872 and local laws and rules. A mining claim may contain as many adjoining locations as the locator may make or buy. There are four categories of mining claims: lode, placer, mill site, and tunnel site.

Minimization mitigation. Minimizing impacts by limiting the degree or magnitude of the action and its implementation (40 CFR, Part 1508.20[b]).

Minimum impact suppression tactics (MIST). The concept of MIST is to use the minimum amount of force necessary to achieve wildland fire management protection objectives, consistent with land and resource management objectives.

Mining Law of 1872. Provides for claiming and gaining title to locatable minerals on public lands. Also referred to as the General Mining Law or Mining Law.

Minor ROWs. Defined as other ROWs not considered major ROWs (see above). Also includes communication sites and towers.

Mitigation. Actions taken to avoid, minimize, or rectify impacts of a land management practice; reducing or eliminating the impact by preservation and maintenance operations.

Modification. A change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or apply to all sites within the leasehold to which the restrictive criteria are applied.

Monitoring. Regularly collecting data to evaluate as to whether objectives or land health standards are being achieved and the effectiveness of management actions.

Mosaic. Landscape elements that are arranged in a pattern that resembles an abstract tile mosaic, where many small patches of varying shape and size fill the entire landscape.

Mountain Pine Beetle Risk. The susceptibility of ponderosa pine stands to infestation by mountain pine beetle, based on stand density: 0-59 square feet of basal area = Low; 60-100 square feet of basal area = Moderate; greater than 100 square feet of basal area = High.

Multiple use management. Management of public land and resource values to best meet various present and future needs of the American people. This means coordinated management of resources and uses to ensure the long-term health of the ecosystem.

Multiplier. A change in an economic measure resulting from a specified change in some other economic measure.

Multi-story. Consisting of an overstory of trees or shrubs and an understory of other smaller plants.

National Environmental Policy Act of 1969 (NEPA). Public Law 91-190, establishes environmental policy for the nation. Among other stipulations, NEPA requires federal agencies to consider environmental values in decision-making.

National Fire Plan. A planning document that directs the actions of USDA Forest Service and Department of the Interior agencies in preparing for wildland fires and reducing their impacts on people and resources. It is based on the key points of firefighting: rehabilitation and restoration, hazardous fuel reduction, community assistance, and accountability.

National Register of Historic Places. A listing of architectural, historical, archaeological, and cultural sites of local, state, or national significance, established by the Historic Preservation Act of 1966 and maintained by the National Park Service.

National Historic Landmark. Nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the United States.

Naturalness (a primary wilderness value). An area that generally appears to have been affected primarily by the forces of nature, wherein the imprint of people's work is substantially unnoticeable.

Net conservation gain. The actual benefit or gain above baseline conditions. For GRSG, the intent is to provide a net conservation gain to the species. To do so, in undertaking BLM management actions, and consistent with valid existing rights and applicable law, in authorizing third-party actions that result in habitat loss and degradation within priority habitat (core population areas and core population connectivity corridors), the BLM will require and ensure mitigation that provides a net conservation gain to the species, including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions.

No surface occupancy (NSO). Use or occupancy of the land surface for fluid mineral exploration and development is prohibited to protect identified resource values. NSO restrictions do not restrict the lessees of fluid minerals from exploiting the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the NSO area. An NSO stipulation may be applied to other uses depending on the type of occupancy and use the potential level of surface disturbance or disruption may create. In most cases, NSO restrictions would not apply to range improvements, structures associated with monitoring, restoration or improvement of wildlife habitat conditions and small scale recreation facilities. Refer to *Surface-disturbing activities* and *Disruptive activities* for related subject matter.

Non-constructional improvements. A practice or treatment that improves the resource condition or production for multiple use. Such improvements may include seedlings; plant control through chemical, mechanical, biological means; prescribed burning; water spreaders; pitting; chiseling; and contour furrowing.

Nonfunctional. Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and thus are not reducing erosion or improving water quality.

Non-invasive introduced species. Plants that meet the introduced species definition and do not spread aggressively from the area in which they originally occurred or were planted. They pose little threat to natural area diversity or managed agricultural area productivity.

Nonnative plant. A plant introduced with human help (intentionally or accidentally) to a new place or new type of habitat where it was not previously found. Note: Not all nonnative plants are invasive.

Nonpoint source pollution. Comes from many sources over a wide area. (Agricultural practices are a major form, including fertilizer runoff into streams.)

Northern Great Plains Joint Venture Program. A USFWS program intended to maintain and increase the populations of high priority wetland, grassland, forest, riverine, and riparian wildlife species in the Northern Great Plains Joint Venture region.

Noxious weed. A plant species designated by federal or state law as generally possessing one or more of the following characteristics: aggressive and difficult to manage; parasitic; a carrier or host of serious insects or disease; or nonnative, new, or not common to the United States.

Nurse crop. A type of vegetation that is used to provide shade, nutrients, or other benefits to seeded vegetation. Nurse crops last for one or two growing seasons and usually consist of annual or short-lived perennial plants.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Off-highway vehicle (OHV). Any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding the following:

- Any nonamphibious registered motorboat
- Any military, fire, emergency, or law enforcement vehicle while being used for emergency purposes
- Any vehicle whose use is expressly authorized by the BLM Authorized Officer or otherwise officially approved
- Vehicles in official use
- Any combat or combat support vehicle when used in times of national defense emergencies

(43 CFR, Part 8340.0-5[a])

Off-road vehicle designations. Public lands designated for OHV use. Lands in the planning area are designated as open, limited, or closed for OHV use.

Open. Designated areas and trails where OHVs may be operated (subject to operating regulations and vehicle standards set forth in BLM Manuals 8341 and 8343). For the purposes of this ARMP, an open area is where all types of motorized vehicles (for example, jeeps, all-terrain vehicles, and motorized dirt bikes) and mechanized uses (mountain bikes, wheelbarrows, and game carts) are allowed to travel freely at all times, anywhere in the area, on roads or cross country, subject to the operating regulations and vehicle standards set forth in 43 CFR, Parts 8341 and 8342. Also, areas that are available for ROWs and associated development.

Paleontological resources. The physical remains or other physical evidence of plants and animals preserved in soils and sedimentary rock formations. Paleontological resources are important for correlating and dating rock strata and for understanding past environments, environmental change, and the evolution of life.

Patented claim. A claim on which title has passed from the federal government to the mining claimant under the Mining Law of 1872.

Planning area. The geographical area for which land use and resource management plans are developed and maintained. The planning area includes the entire state of South Dakota. See also *Decision area*.

Perennial stream. A stream in which water is present during all seasons of the year.

Permeability. The quality of the soil that enables water to move downward through the profile, measured as the number of inches per hour that water moves downward through the saturated soil.

Permitted use. The forage allocated by, or under the guidance of, an applicable land use plan for livestock grazing in an allotment under a permit or lease and is expressed in AUMs.

Personal income. Employee compensation plus property income.

Personal use. Use other than for sale, barter, trade, or obtaining a profit (43 CFR, Part 5400.0-5).

Pest. Any plant or animal (including insects, mites, weeds, bacteria, fungi, viruses, and vertebrates) whose activities interfere with human health, convenience, comfort, or profits. Broadly defined to include pests affecting food, fiber, and shelter, pests that threaten public health, and nuisance pests.

Philtown Road. Locally known as Old Stone Road. It extends from the west boundary of Fort Meade Recreation Area ACEC to the Backcountry Byway and is opened as a bypass during the Sturgis Motorcycle Rally.

Point source pollution. Input of pollution from a single source in a specific location.

Policy. A guiding principle that a specific decision or set of decisions is based on.

Potential fossil yield classification (PFYC). Geologic units are classified according to this system, usually at the formation or member level, based on the relative abundance of significant fossils and their sensitivity to adverse impacts. The classification uses a ranking of 1 through 5, with Class 5 assigned to units with a very high potential for fossils, as follows:

Class 1 – Very Low. Igneous or metamorphic geologic units, or other units not likely to contain recognizable fossil remains. Management concern is negligible for Class 1 units and mitigation requirements are rarely necessary.

Class 2 – Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or significant invertebrate fossils. Management concern is low for Class 2 units and mitigation requirements are not likely.

Class 3 – Moderate or Unknown. Fossiliferous sedimentary geologic units, where fossil content varies in significance, abundance, and predictable occurrence, or sedimentary units of unknown fossil potential. Management concern may extend across the entire range of management. Ground-disturbing activities require sufficient assessment to determine whether

significant resources occur in the area of the proposed action and whether the action could affect the paleontological resources. Pre-disturbance surveys, monitoring, or avoidance may be necessary.

Class 4 – High. Geologic units containing known occurrences of significant fossils, but these occurrences may vary in local abundance and predictability. Management concern is moderate to high, depending on the potential impacts of the proposed action and local geologic conditions. Pre-disturbance field surveys are often needed, and avoidance or on-site monitoring may often be necessary during project activities.

Class 5 – Very High. Highly fossiliferous geologic units that consistently and predictably produce significant fossils and that are at risk of human-caused adverse impacts or natural degradation. Class 5 areas merit a high level of management focus. Mitigation of ground-disturbing activities, including pre-disturbance surveys, on-site monitoring, or avoidance procedures, are nearly always necessary. These units are often the focus of illegal collecting activities. Special management designations may be appropriate for protection or interpretation.

Potential natural community (PNC). The biotic community that would become established on an ecological site if all successional sequences were completed without interferences by man under the present environmental conditions. Natural disturbances are inherent in its development. The PNC may include acclimatized or naturalized nonnative species.

Potential to emit. The maximum capacity of a facility or emitting unit, within physical and operational design, to emit a pollutant. Any physical or operational limitation on the capacity of the facility or emitting unit to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, is treated as part of its design only if the limitation or the effect it would have on emissions is federally enforceable.

Pre-commercial thinning. The removal of trees not for immediate financial return but to reduce stocking to concentrate growth on the more desirable trees.

Prescribed burning. Controlled application of fire to wildland fuels in either their natural or modified state. This burning is done under specified environmental conditions that allow the fire to be confined to a predetermined area and at the same time to produce the fire line intensity and rate of spread required to attain planned resource management objectives.

Prescribed fire. A wildland fire originating from a planned ignition to meet specific objectives identified in a written, approved, prescribed fire plan for which NEPA requirements have been met before ignition.

Prescription. In terms of fire and fuels management, prescriptions are practices to accomplish specific land and resource management objectives and measurable criteria that guide the selection of appropriate management actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, and legal considerations under which a fire will be allowed to burn. Also, a specific set of management practices or techniques that are usually applied at the implementation level to accomplish natural resource goals or objectives.

Prevention of significant deterioration (PSD). A regulatory program under the Clean Air Act (Public Law 84-159, as amended) to limit air quality and AQRV degradation in areas currently achieving the National Ambient Air Quality Standards. The PSD program established air quality classes in which differing amounts of additional air pollution are allowed above a legally defined baseline level. Small additional air pollution may be considered significant in PSD Class I areas (certain large national parks and wilderness areas in existence on August 7, 1977, and specific tribal lands redesignated since then). PSD Class II areas allow deterioration associated with moderate well-controlled growth (most of the country). Area classes are described below.

Class I—An area that allows only minimal degradation above the baseline. The Clean Air Act designated existing national parks over 6,000 acres and national wilderness areas over 5,000 acres in existence on August 7, 1977, as mandatory federal Class I areas. These areas also have special visibility protection. In addition, four tribal governments have redesignated their lands as Class I Areas.

Class II—An area that allows moderate degradation above the baseline. Most of the United States (outside nonattainment areas) is Class II.

Class III—Any area that allows the maximum amount of degradation above the baseline. Although Congress allows air quality regulatory agencies to redesignate Class II lands to Class III, none have been designated.

Prevention of significant deterioration (PSD) increment and increment analysis. The allowable PSD increment is the change in pollutant concentration allowed in a Class I, II, or III area. PSD increment values are provided in EPA regulations. As performed by the BLM for NEPA analysis, PSD increment analysis is a method of comparing predicted (modeled) pollutant concentrations to the EPA's allowable PSD increment values for the purpose of public disclosure only. The BLM increment analysis is not a regulatory analysis. State air quality agencies and the EPA perform regulatory PSD increment analyses.

Primitive and unconfined recreation (a primary wilderness value). Nonmotorized and undeveloped types of outdoor recreation. Refers to wilderness recreation opportunities, such as nature study, hiking, photography, backpacking, fishing, hunting, and other related activities. Does not include the use of motorized vehicles, bicycles, or other mechanized means of travel. Also, a recreational setting characteristics (RSC) class that contains an undisturbed landscape. Other RSC criteria apply as described in **Appendices L and M**.

Primitive road. A linear route managed for by four-wheel drive or high-clearance vehicles. Primitive roads do not normally meet any BLM road design standard.

Priority habitat management areas (PHMA). Areas with limited impacts containing substantial and high quality GRSG habitat that support sustainable GRSG populations. Management decisions will emphasize the protection and enhancement of sustainable GRSG populations. Areas are delimited by using key, core, and connectivity data and maps and other resources.

Probable sale quantity (PSQ). The allowable harvest level that can be maintained without decline over the long term if the schedule of harvest and regeneration are followed. Not a commitment to offer for sale a specific level of timber volume every year.

Problem or problematic soil. Soils with physical or chemical properties that make reclamation difficult. Some examples are soils with high salinity or sodicity, soils with low fertility, soils that lack cohesiveness and are susceptible to erosion, and soils with extremely high clay content.

Productivity.

Soil productivity: The capacity of a soil to produce plant growth, due to its chemical, physical, and biological properties, such as depth, temperature, water-holding capacity, and mineral, nutrient, and organic matter content.

Vegetative productivity: The rate of production of vegetation within a given period.

General: The innate capacity of an environment to support plant and animal life over time.

Project level planning. NEPA planning conducted at the individual project scale for implementing the selected alternative of the RMP/EIS or to ensure project level requests are consistent with the direction found in the selected alternative of the RMP. Also referred to as implementation planning.

Proper functioning condition. Referring to riparian-wetlands, properly functioning when adequate vegetation, landform, or large woody debris are present to dissipate stream energy associated with high water flows. The functioning condition of these areas is influenced by geomorphic features, soil, water, and vegetation.

Public land. Any land or interest in land owned by the United States and administered by the Secretary of the Interior through the BLM.

Public road. Part of a public agency road system. A public road is not within the BLM's jurisdiction, does not receive support from BLM construction or maintenance funds, and is not subject to BLM regulations. This differs from a road built to serve a BLM facility, which the public is allowed to use, such as a road to a recreation site. A BLM road remains under BLM control, even though it serves the general public. The BLM administers no legal public roads. A public road must meet the criteria for public roads as established by the Secretary of Transportation (23 USC, Sections 101 and 104).

Range of historical variability. Ecological conditions and the spatial and temporal variation in these conditions that are relatively unaffected by people within a period and geographical area appropriate to an expressed goal.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grass-like plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundra, and areas that support certain forb and shrub communities.

Rangeland health. The degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained.

Raptor. Bird of prey with sharp talons and strongly curved beaks, such as hawks, owls, vultures, and eagles.

Reclamation. Returning disturbed lands to a form and productivity that will be ecologically balanced and in conformity with a predetermined land management plan.

Reconstruction. Replacing, rebuilding, or restoring an improvement, facility, or treatment, such as a fence, spring development, cattle guard, road, trail, building, or parking lot, to its original or modified condition.

Recreation opportunity spectrum. A means of characterizing recreation opportunities in terms of setting, activity, and experience opportunities.

Recreation setting characteristic. A method for describing setting characteristics for recreation use, drawing on physical, social, and operational facets. See **Appendices L** and **M**.

Recreation site. An area where management actions are required to provide a specific recreation setting and activity opportunities to protect resource values, to provide public visitor safety and health, or to meet public recreational use demands and recreation partnership commitments. A site may or may not have permanent facilities.

Recreation use permits. Authorizations for use of developed facilities that meet the fee criteria established by the Land and Water Conservation Fund Act of 1964, as amended, or subsequent authority (such as the pilot fee demonstration program). Recreation use permits are issued to ensure that US residents receive a fair and equitable return for the use of those facilities to help recover the cost of construction, operation, maintenance, and management of the permits.

Recreational gold panning. See *Casual use*.

Reference conditions. Information on the vegetation structure and composition and the processes that shaped them that are used to define management or restoration goals.

Refugia. An area where special environmental circumstances have enabled a species or community of species to survive after decline or extinction in surrounding areas

Rehabilitation. The activities necessary to repair damage or disturbance caused by wildfire or the fire suppression activity.

Removal site evaluation. A document that determines if a removal action is necessary, which is composed of a preliminary assessment and a site inspection.

Reportable quantity. The amount of a hazardous material or substance that is considered reportable under CERCLA. Reportable quantities are one pound or greater or an amount as established and listed at 40 CFR, Part 302.4, or under Section 111 of the Clean Water Act.

Required Design Features (RDFs). Required for certain activities in all GRSG habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level, when

the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g., due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable.
- An alternative RDF, state-implemented conservation measure, or plan-level protection is determined to provide equal or better protection for GRSG or its habitat.
- A specific RDF will provide no additional protection to GRSG or its habitat.

Reserve common allotment. An area designated in the land use plan as available for livestock grazing but reserved as an area available for use as an alternative to grazing in another allotment in order to facilitate rangeland restoration treatments and recovery from natural disturbances, such as drought or wildfire. The reserve common allotment would provide needed flexibility that would help the agency apply temporary rest from grazing where vegetation treatments and management would be most effective.

Resource management plan. A land use plan as described by the FLPMA.

Restoration. Actions taken to modify an ecosystem to achieve desired, healthy, and functioning conditions and processes. May be used in the context of repair or reestablishment of a specific component of the ecosystem, such as vegetation restoration.

Retirement. Ending livestock grazing on a specific area of land.

Right-of-way. A permit or an easement authorizing the use of public land for certain specified purposes, commonly for pipelines, roads, telephone lines, electric lines, and reservoirs. Also, the reference to the land covered by such an easement or permit.

Right-of-way avoidance area. An environmentally sensitive area where a right-of-way may be granted only when no feasible alternative is available.

Right-of-way corridor. A parcel of land identified by law or by order of the Secretary of the Interior, through a land use plan, or by other management decision as being the preferred location for existing and future rights-of-way grants and suitable to accommodate one type of right-of-way or one or more rights-of-way that are similar, identical, or compatible.

Right-of-way exclusion area. An environmentally sensitive area where a right-of-way will be granted only in cases where there is a legal requirement to provide such access.

Rilling. Formation of channels by concentrated surface runoff that is less than one square foot in cross-sectional area. It typically forms where rainfall and surface runoff is concentrated on fill slopes, cut banks, and ditches. Larger channels are called gullies.

Riparian. BLM Technical Reference 1737-9 defines riparian areas as a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Lands along perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation (USDI BLM 1998).

Riparian/aquatic system. Interacting system between aquatic and terrestrial situations. Identified by a stream channel and distinctive vegetation that requires or tolerates free or inbound water.

Riparian ecosystem. The ecosystems around or next to water areas that support unique vegetation and animal communities as a result of the influence of water.

Road. A linear route declared a road by the owner, managed for use by low-clearance vehicles having four or more wheels, and maintained for regular and continuous use.

Roadless. Refers to the absence of roads that have been constructed and maintained by mechanical means to ensure regular and continuous use.

Roadway. As used herein, the portion of a road within the limits of the excavation and embankment.

Routes. A combination of roads, trails, or ways that are used by motorized vehicles (such as jeeps, all-terrain vehicles, and motorized dirt bikes), mechanized uses (mountain bikes, wheelbarrows, and game carts), pedestrians (hikers), and horseback riders.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff.; water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from groundwater.

Sage-grouse. In this plan, this term refers only to GRSG (*Centrocercus urophasianus*).

Salable minerals. Common varieties of mineral materials such as sand, gravel, and stone, as well as petrified wood. Common mineral materials may be sold or disposed of through free use permits under the provision of the Materials Act of July 31, 1947, amended July 23, 1955, and September 25, 1962.

Saline soil. A soil containing soluble salts in an amount that impairs the growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand (geology). A rock fragment or detrital particle between 0.0025 and 0.08 inch in diameter.

Saw timber. Trees or logs that are large enough (usually at least 9 inches in diameter) to be sawed into lumber. Minimum length is usually 8 feet.

Scenic river. A river or section of a river that is free of impoundments and whose shorelines are largely undeveloped but accessible in places by roads.

Section 03 Grazing Permit. Issued to graze livestock on public lands within grazing districts, as outlined in the Taylor Grazing Act, as amended 1934. Grazing preference is given to nearby landowners

engaged in the livestock business or owners of water or water rights as may be necessary to permit the proper use of the land or water that they own.

Section 15 Grazing Lease. Grazing lease issued to graze livestock on public lands outside of grazing districts, as outlined in the Taylor Grazing Act, as amended 1934. Grazing preference is given to landowners owning land contiguous with public lands.

Section 202 lands. Lands being considered for wilderness designation under Section 202 of FLPMA.

Sediment. Soil, rock particles, and organic or other debris carried from one place to another by wind, water, or gravity.

Sensitive Class II Area. A Class II area under the Prevention of Significant Deterioration (PSD) Program for which a federal land management agency, state agency, or tribal authority requests air quality-related value (AQRV) analysis comparable to that performed for PSD Class I areas. Agencies with jurisdiction over sensitive Class II areas sometimes request that the lead agency implement mitigation measures to protect AQRVs at sensitive Class II areas. Sensitive Class II areas are not addressed by the Clean Air Act.

Sensitive Soil. Characteristics may include erodibility by water and wind, compaction, fugitive dust resistance, and reclamation suitability. The criteria to define and identify areas with sensitive soils in this ARMP were outlined by the BLM's State Coordinator for Soils, Water, and Riparian, soil scientists in the BLM Montana-Dakotas organization, and the NRCS. The method was outlined in an original organization-specific reclamation suitability interpretation criteria. Sensitive soils is equivalent to representative slope* multiplied by wind erodibility index* greater than or equal to seven (where * designates individual interpretations within the NRCS's Soil Survey Geographic Databases [USDA NRCS 2011]). A site-specific evaluation found that some steep slopes were overlooked by this analysis in South Dakota. This problem did not present itself in other BLM Montana-Dakota field offices. Since every state NRCS conducts soil surveys in a slightly different manner, this issue was addressed by the BLM South Dakota Office by adding slopes over 25% from the Digital Elevation Model data to the sensitive soils criteria for GIS analysis. The criteria used to define and identify areas with sensitive soils may be adapted as conditions change or new information or technology becomes available. The criteria used to define and identify areas with sensitive soils may be adapted as conditions change or new information or technology becomes available.

Series, soil. A nationally defined soil type set apart on distinct soil properties that affect use and management. In a soil survey, this includes a group of soils that have profiles that appear most alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Seral. Refers to species or communities that are eventually replaced by other species or communities within a sere (a natural succession of plant or animal communities, especially a full series from uncolonized habitat to the appropriate climax vegetation).

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by rainfall and surface runoff.

Shoulder. The portion of the roadway contiguous to the travel way for accommodation of stopped vehicles, for emergency use, and for lateral support of pavement structure or the edge of the travel way if no shoulder width exists.

Significant paleontological resource (also, significant fossil resource). Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be scientifically important because it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has identified educational or recreational value.

Silviculture. The science, art, and practice of caring for, cultivating, managing, and development of forests.

Slash. Debris left after logging, pruning, thinning, or brush cutting; can include logs, chips, bark, branches, stumps, and broken understory trees or brush.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. For example, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Snags. Standing dead trees with no live branches.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Soil. A natural, three-dimensional body at Earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over time.

Soil association. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single soil map unit.

Soil classification. The systematic arrangement of soils into groups or categories on the basis of their characteristics.

Soil compaction. An increase in soil bulk density of 15 percent or more from the undisturbed level.

Soil complex. A map unit of two or more kinds of soils in such an intricate pattern or so small an area that it is not practical to map them separately at the selected scale of mapping.

Soil productivity. The capacity of a soil for producing a specified plant or sequence of plants under specific management.

Soil profile. A vertical section of the soil extending through all its horizons and into the parent material.

Soil survey. A field investigation resulting in a soil map showing the geographic distribution of various kinds of soil and an accompanying report that describes the soil types and interprets the findings

Soil texture. The relative proportions of sand, silt, and clay particles in a mass of soil.

Source water protection area. An area defined by a community, that contributes water to a well, and is protected from certain activities and sources of pollution to avoid costly treatment or relocation.

South Dakota Oil and Gas Reasonably Foreseeable Development Study Area. The geographical area in western South Dakota studied for the oil and gas reasonably foreseeable development scenario.

Special recreation management area (SRMA). An administrative unit where existing or proposed recreation opportunities and RSCs are recognized for their unique value, importance, or distinctiveness, especially as compared to other areas used for recreation.

Special recreation permits. Authorizations that allow for recreational uses of public lands and related waters. Issued as a means to control visitor use, to protect recreational and natural resources, and to provide for the health and safety of visitors. Commercial special recreation permits also are issued as a mechanism to provide a fair return for the commercial use of public lands.

Special status species. Plant or animal species known to be or suspected to be limited in distribution, rare or uncommon within a specific area, or vulnerable to activities that may affect their survival. Lists of special status species are prepared by knowledgeable specialists throughout South Dakota. The BLM updates the list of BLM sensitive species as new information becomes available or new direction and guidance is provided.

Special stipulation. A specific operating condition or limitation added to a mineral lease to protect sensitive resources that modifies the original terms and conditions of that lease.

Spot treatment. The application of herbicides directly on or around the undesired plants.

Stand. A group of standing trees that usually has characteristics that would distinguish it from other stands. Differences could be the species, average diameter, density, and location.

Stand density. An expression of the total stocking of a stand of trees and is measured in square feet of basal area per acre.

Stand replacement. When a stand has been totally modified by some disturbance (fire, insects, disease, or logging) and needs to start or be started over.

Standard. A principle that must be followed or a condition that must be met.

Standard landscape assessment. Method of determining characteristics that make up a landscape. Means of describing a geographic area using GIS.

Stewardship contracting. Allows private organizations or businesses to remove forest products, such as trees and undergrowth, in return for performing work to restore and maintain healthy forest

ecosystems. Work performed under stewardship contracts can provide a source of local employment and income to contribute to the development of sustainable communities.

Stipulations. Requirements that are part of the terms of an authorization, usually a mineral lease. In this plan, stipulations and restrictions may be consolidated under the general term restrictions. Some stipulations are standard on all federal leases; other stipulations may be applied to the lease at the discretion of the surface management agency to protect valuable surface resources and uses. An oil and gas lease stipulation is a condition of lease issuance that provides a level of protection for other resource values or land uses by restricting lease operations during certain times or locations or to avoid unacceptable impacts, to an extent greater than standard lease terms or regulations. A stipulation is an enforceable term of the lease contract, supersedes any inconsistent provisions of the standard lease form, and is attached to and made a part of the lease. Lease stipulations further implement the BLM's regulatory authority to protect resources or resource values. Lease stipulations are developed through the land use planning process.

Steep slopes. Areas with steep slopes may present a management problem when disturbances on the surface cause unacceptable resource impacts (loss of soil productivity or excessive downslope sedimentation) or can be difficult to reclaim. Within this RMP, steep slopes, currently defined as areas with a slope over 25 percent, are incorporated into the sensitive soil criteria. See *Sensitive soils*.

Structure. How the parts of ecosystems are arranged, both horizontally and vertically. Structure might reveal a pattern, mosaic, or total randomness of vegetation.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates.

Succession. The progressive replacement of plant communities on a site following disturbance. Described in terms of early, mid, late, and potential natural community.

Suppression. All the work of extinguishing a fire or confining fire spread.

Surface occupancy and use. See *No surface occupancy (NSO)*.

Surface fuels. Loose litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branch wood, downed logs, and stumps interspersed with or partially replacing the litter.

Sustained yield. Maintenance of an annual or regular periodic output of a renewable resource from public land and consistent with the principles of multiple use.

Surface-disturbing activities. The physical disturbance or removal of land surface and vegetation. Some examples of surface-disturbing activities include construction of roads, well pads, pipelines, power lines, pits and reservoirs, facilities, recreation sites, and mining. Vegetation renovation treatments that involve soil penetration or substantial mechanical damage to plants (plowing, chiseling, and chopping) are also surface-disturbing activities. This definition is not intended to prohibit all activities or authorized uses. For example, emergency activities, such as fire suppression and search and rescue, rangeland monitoring, routine maintenance associated with an approved authorization, dispersed recreational

activities, such as hunting and hiking, and livestock grazing are not considered surface-disturbing activities.

Technically/Economically Feasible. Actions that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant. It is the BLM's sole responsibility to determine what actions are technically and economically feasible. The BLM will consider whether implementation of a proposed action is likely, given past and current practice and technology; this consideration does not necessarily require a cost/benefit analysis or speculation about an applicant's costs and profit (modified from the CEQ's 40 Most Asked Questions and BLM NEPA Handbook, Section 6.6.3).

Terrestrial. Living or growing in or on the land.

Thinning. Reduction in density of stocking by harvesting or deadening trees to prevent overcrowding and stagnation of a stand of trees, to accelerate growth or to improve the health of the trees that remain.

Threatened species. Any species or significant population of that species likely to become endangered within the foreseeable future throughout all or a significant portion of its range. Usually includes only those species that have been recognized and listed as threatened by federal and state governments but may include species categorized as rare, very rare, or depleted.

Timber. Standing trees, downed trees, or logs that are capable of being measured in board feet.

Timeliness. The lack of a time lag between impacts and the achievement of compensatory mitigation goals and objectives (BLM Manual Section 1794).

Timing limitation (seasonal restriction). Prohibits surface use during specified periods to protect identified resource values.

Total dissolved solids. Salt or an aggregate of carbonates, bicarbonates, chlorides, sulfates, phosphates, and nitrates of calcium, magnesium, manganese, sodium, potassium, and other cations that form salts.

Total maximum daily load. A calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards and an allocation of that amount to the pollutant's sources. The sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources.

Traditional cultural property. A cultural property that is eligible for inclusion in the National Register of Historic Places because of its association with a living community's cultural practices or beliefs that are rooted in that community's history and are important in maintaining the community's continuing cultural identity.

Trail. A linear route managed for human-powered, stock, or off-highway vehicle forms of transportation or for historical values. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

Travel management area (TMA). Polygons or delineated areas where travel management (either motorized or nonmotorized) needs particular focus. These areas may be designated as open, closed, or limited to motorized use and will typically have an identified or designated network of roads, trails, ways, and other routes that provide for public access and travel across the planning area. All designated travel routes within TMAs should have a clearly identified need and purpose as well as clearly defined activity types, modes of travel, and seasons or times for allowable access or other limitations.

Trend. The direction of change in ecological status observed over time. Trend is described as toward or away from the potential natural plant community or as not apparent. Trend is also used to describe an increase or decrease in a population or an activity or types of an activity over a period of time.

Trespass. Any unauthorized use of public land.

Two-aged silvicultural system. A planned sequence of treatments designed to maintain and regenerate a stand with two age classes.

Understory. That portion of a plant community growing underneath the taller plants on the site. All the plants that grow beneath the main canopy of a forest. The understory may contain seedlings of the overstory trees, small trees, shrubs, and forbs.

Undertaking. According to 36 CFR, Part 800.16(y), a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency, those carried out with federal financial assistance, and those requiring a federal permit, license, or approval.

Uneven-aged silvicultural system. A planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes.

Unplanned ignition. The initiation of a wildland fire by lightning, volcanoes, and unauthorized and accidental human-caused fires.

Upland (geology). In general, land at a higher elevation than the alluvial plain or stream terrace; land above the lowlands along streams.

Utility corridor. Tract of land varying in width and forming passageway that various commodities, such as oil, gas, and electricity, are transported through.

Valid existing right. Documented legal rights or interests in the land that allow a person or entity to use said land for a specific purpose and that are still in effect. Such rights include fee title ownership, mineral rights, rights-of-way, easements, permits, and licenses. Such rights may have been reserved, acquired, leased, granted, permitted, or otherwise authorized over time.

Vegetation loss. The loss of vegetation cover.

Vegetation manipulation. Alteration of present vegetation by using fire, plowing, or other means to manipulate natural succession trends.

Vegetation type. A plant community with immediately distinguishable characteristics based on and named after the apparent dominant plant species.

Vertebrate. An animal having a backbone or spinal column.

Viewshed. Everything that can be seen from a certain point.

Visual resources. The visible physical features on a landscape (topography, water, vegetation, animals, structures, and other features) that comprise the scenery of the area.

Visual Resource Management. The inventory and planning actions taken to identify visual resource values and to establish objectives for managing those values and the management actions taken to achieve the visual resource management objectives.

Visual Resource Management Classes. Used to identify the degree of acceptable visual change within a characteristic landscape. A classification is assigned to public lands based on the guidelines established for scenic quality, visual sensitivity, and visibility.

Class I provides for natural ecological changes with very little management activity. This class includes primitive areas, some natural areas, some wild and scenic rivers, and other similar areas where landscape modification activities should be restricted.

Class II areas are those areas where changes in any of the basic elements (form, line, color, or texture) caused by management activity should not be evident in the characteristic landscape. The goal is to retain the existing landscape character.

Class III includes areas where changes in the basic elements (form, line, color, or texture) caused by a management activity may be evident in the characteristic landscape. The level of change from an activity should not dominate the landscape, but may attract attention of the casual observer. Changes should repeat the basic landscape elements.

Class IV applies to areas where changes may subordinate the original composition and character; however, they should reflect what could be a natural occurrence within the characteristic landscape, if possible. The level of change to the existing landscape can be high and may dominate the view. This class provides for management activities which require modification to the existing landscape character.

Visual sensitivity. A measure of public concern for scenic quality and existing or proposed visual change.

Waiver. A waiver is a permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

Waiver, Exceptions and Modification. Exceptions, waivers, and modifications provide an effective means of applying adaptive management techniques to oil and gas leases and associated permitting activities to meet changing circumstances. The criteria for approval of exceptions, waivers, and modifications should be supported by NEPA analysis, either through the land use planning process or site-specific environmental review. An exception, waiver, or modification must be based on one of two

criteria. According to 43 CFR, Part 3101.1-4, “A stipulation included in an oil and gas lease shall be subject to modification or waiver only if the authorized officer determines that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or if the proposed operations would not cause unacceptable impacts.” Refer to **Appendix G** for more information.

WAFWA GRSG Conservation Team. WAFWA management zones are used to identify and address cross-state issues, such as regional mitigation and adaptive management monitoring and response, through WAFWA GRSG Conservation Teams. These teams convene to advise on these specific tasks and use existing coordination and management structures to the extent possible.

Watershed. Topographical region or area delineated by water draining to a particular watercourse or body of water.

Waterway. Any body of water including lakes, rivers, streams, and ponds whether or not they contain aquatic life.

Way. As used herein, a road-like feature used by vehicles having four or more wheels but not declared a road by the owner and which receives no maintenance to guarantee regular and continuous use.

Wetlands. Federal policy defines wetlands as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and which, under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. BLM Manual 1737, Riparian-Wetland Area Management, includes marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas as wetlands (USDI BLM 1998).

Wilderness. An area formally designated by Congress as a part of the National Wilderness Preservation System.

Wildfire. An unplanned ignition of a wildland fire, such as that caused by lightning, volcanoes, unauthorized and accidental human-caused fires, and escaped prescribed fires.

Wildland fire. A general term describing any non-structure fire that occurs in the wildland.

Wildland Fire Decision Support System. This system assists fire managers and analysts in making strategic and tactical decisions for fire incidents, as follows:

- Develops a scalable decision support system for agency administrators
- Uses appropriate fire behavior modeling, economic principles, and information technology
- Supports effective wildland fire decisions consistent with resource and fire management plans
- Removes alternative comparison and decision tree development
- Pre-loads information from land management plans/fire management plans, other sources, planned decision criteria, local spatial data files
- Provides scalability for incident complexity

- Can be ended at any level, can progress through levels, or jump to appropriate level

Wildland urban interface. The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel.

Wintering areas or winter range. Areas with woody vegetation or trees that are used by wildlife for hiding, sheltering, or foraging during winter. Wintering areas in the South Dakota RMP planning area include riparian areas with shrubs or trees, juniper woodlands, large woody draws, rough topographic lands within the Two Rivers Area, and sagebrush cover over 10 percent.

Withdrawal. An action that restricts the use of public land and segregates the land from the operation of some or all of the public land and mineral laws. Withdrawals are also used to transfer jurisdiction of management of public lands to other federal agencies.

Woodland. Forest land on which trees are present but form only an open canopy, the intervening areas being occupied by lower vegetation. Forest lands that produce or are capable of producing no more than 20 cubic feet per acre per year of commercially important tree species.

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CHAPTER 7

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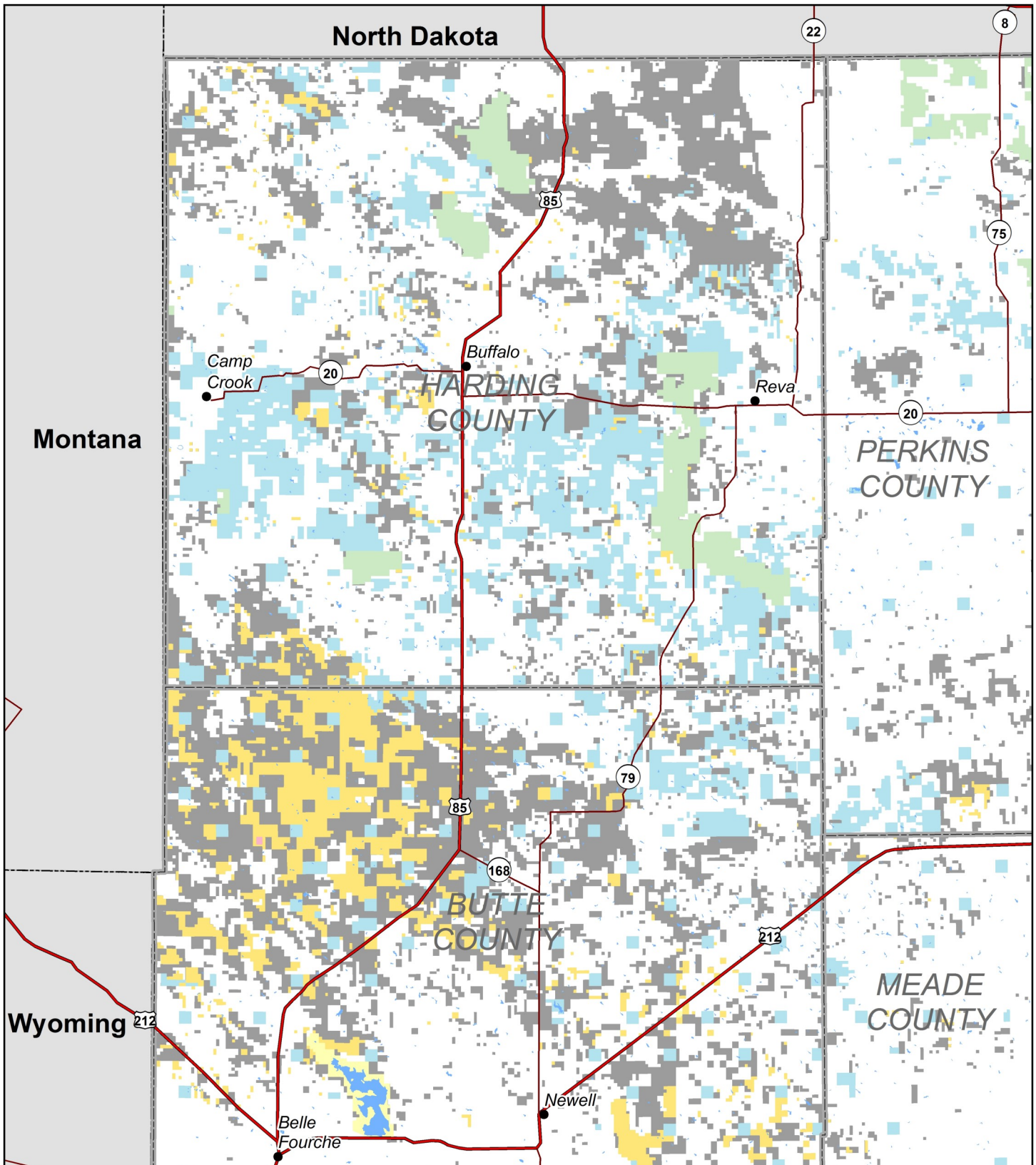


Figure 1-1: South Dakota Planning Area, Surface Management and Sub-Surface Estate

- | | |
|--|---|
| Bureau of Land Management | State/Local |
| U.S. Forest Service | Private/Other |
| Bureau of Reclamation | Water |
| Department of Defense | Non-Federal Surface, Federal Sub-Surface |
| | Planning Area Boundary |
| | State Boundary |



0 5 10 Miles

September 2015

Map Area



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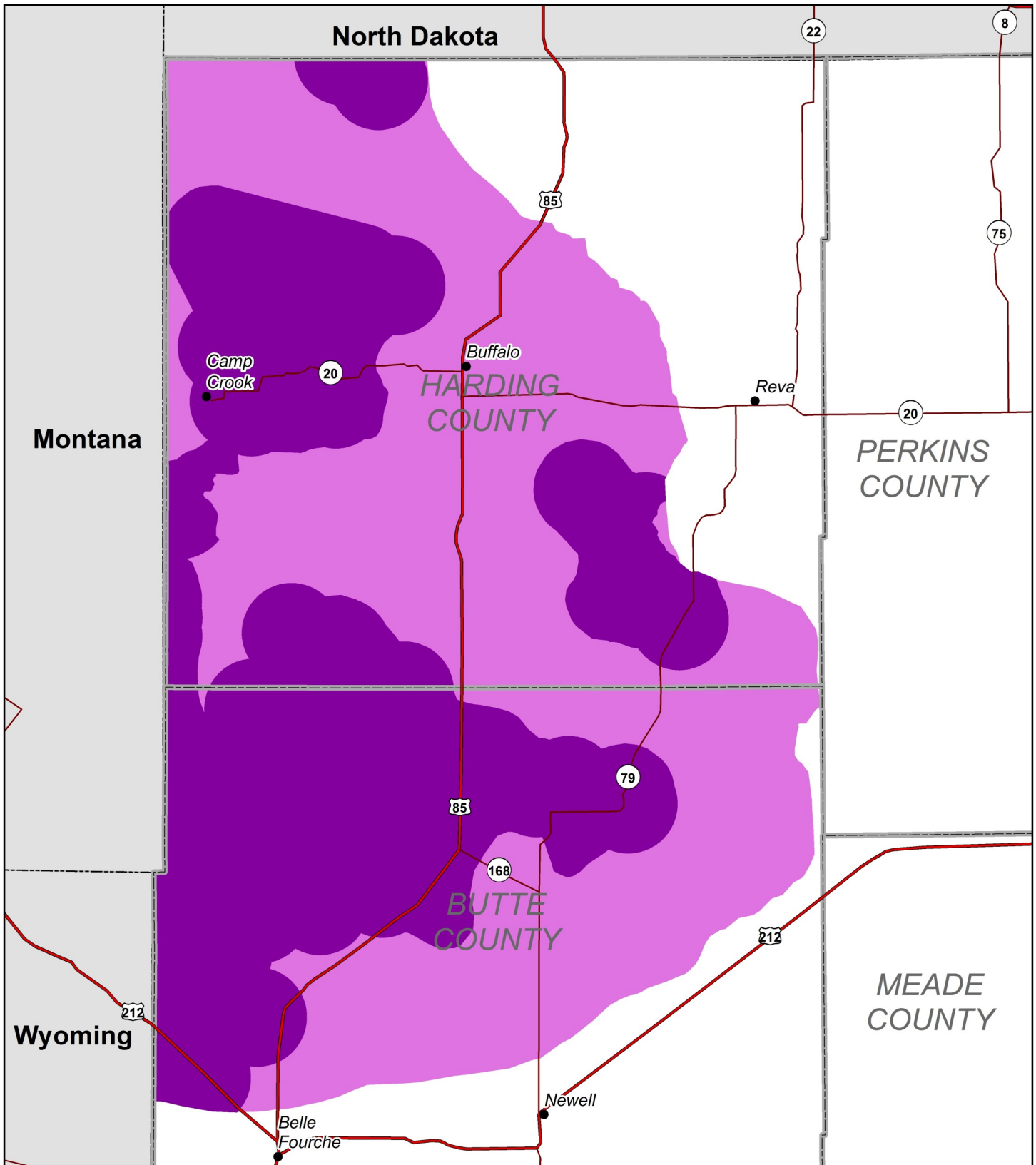


Figure 1-2: South Dakota Planning Area, Greater Sage-Grouse Habitat Management Areas Across All Jurisdictions

- Priority Habitat Management Areas (PHMAs)
- General Habitat Management Areas (GHMAs)
- Planning Area Boundary
- State Boundary



0 5 10 Miles

September 2015

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Map Area



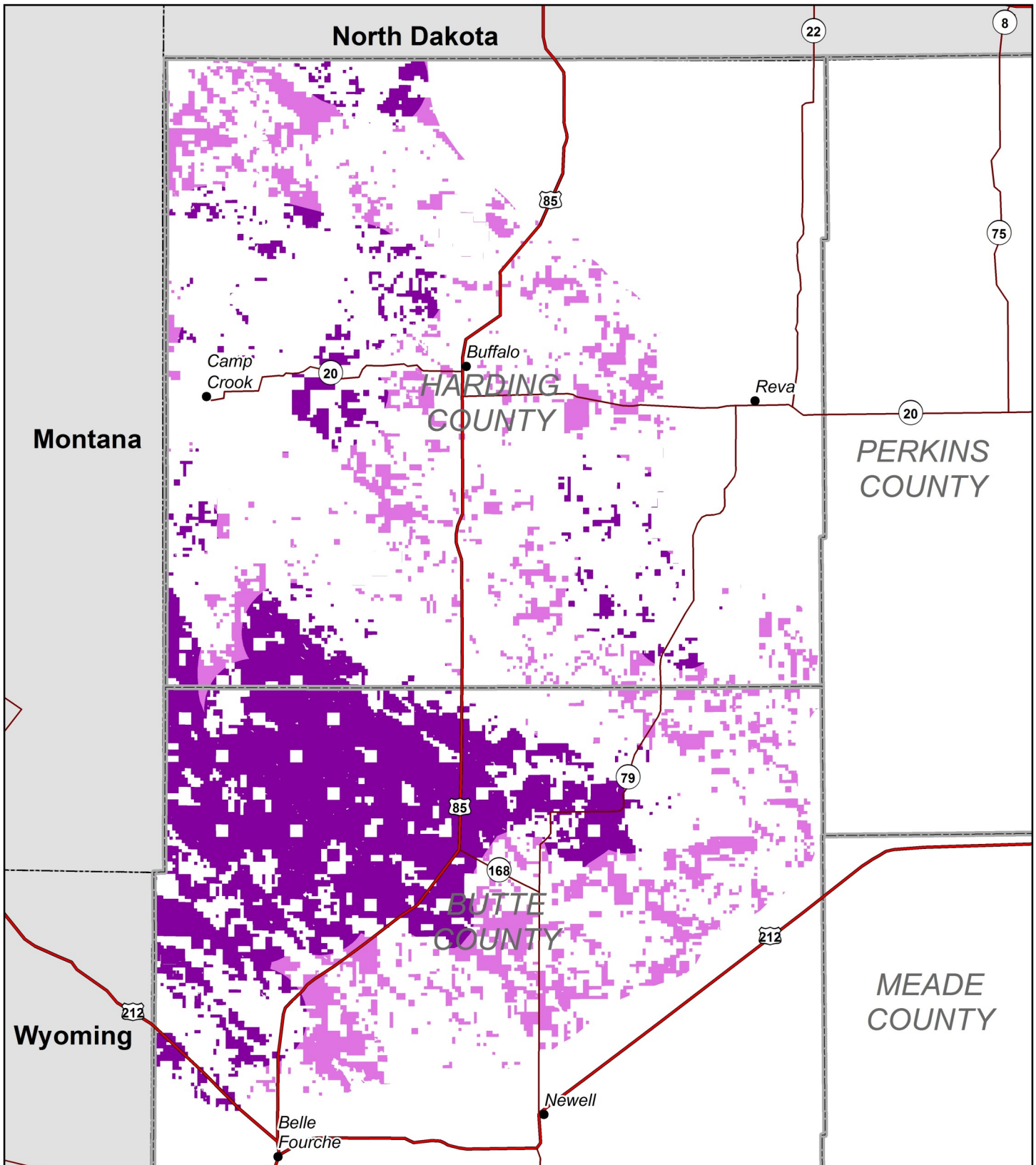


Figure 1-3: South Dakota Decision Area, Greater Sage-Grouse Habitat Management Areas for BLM Administered Lands

- Priority Habitat Management Areas (PHMAs)
- General Habitat Management Areas (GHMAs)
- Planning Area Boundary
- State Boundary



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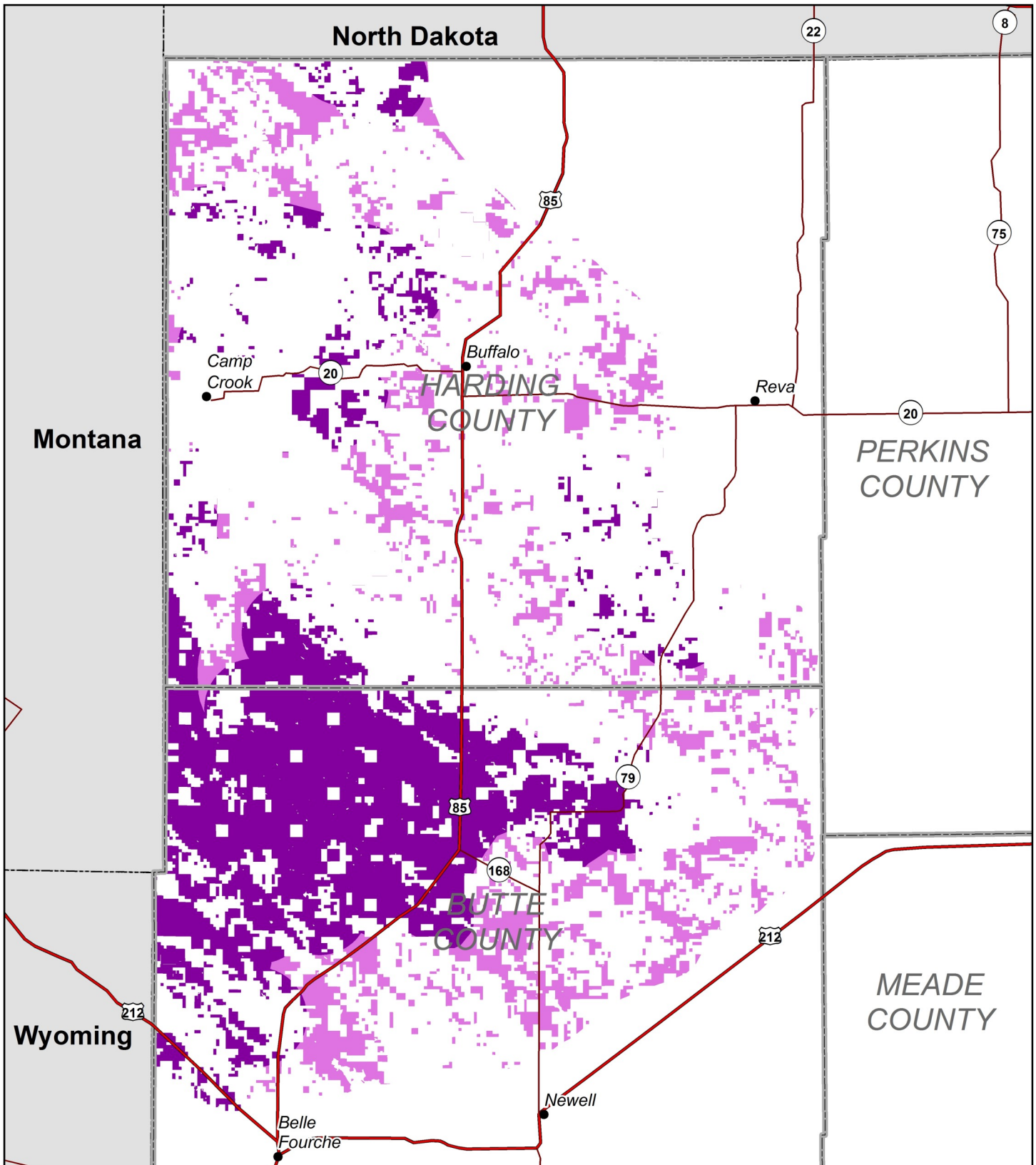


Figure 2-1: South Dakota Habitat Management Areas

- Priority Habitat Management Areas (PHMAs)
- General Habitat Management Areas (GHMAs)
- Planning Area Boundary
- State Boundary



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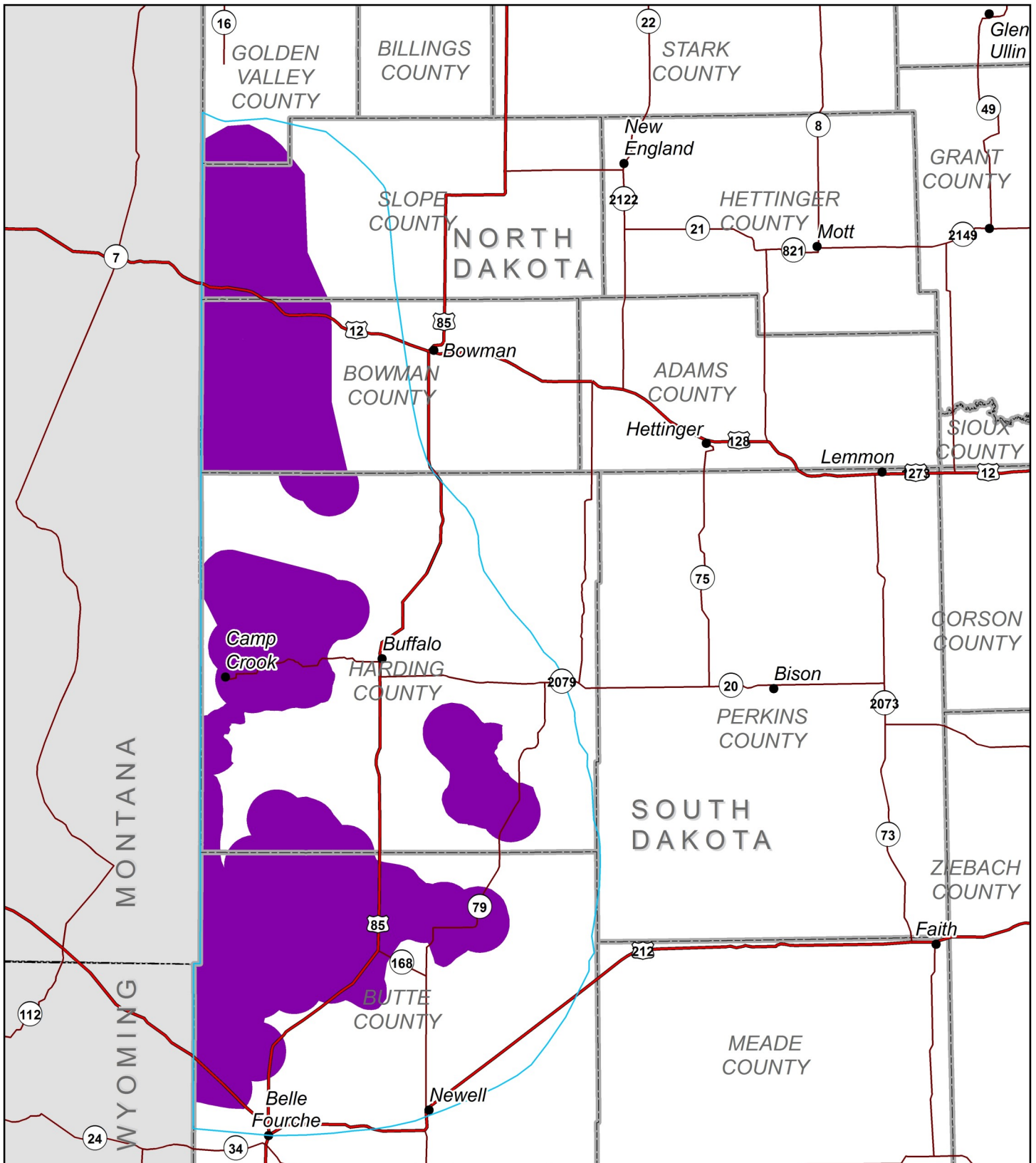






Figure 2-2: North Dakota and South Dakota GRSG Biologically Significant Units and Priority Habitat Management Areas

- | | |
|---|--|
|  Biologically Significant Units (BSUs) |  Planning Area Boundary |
|  Priority Habitat Management Areas (PHMAs) |  State Boundary |



0 2.5 5 10 15 20 Miles

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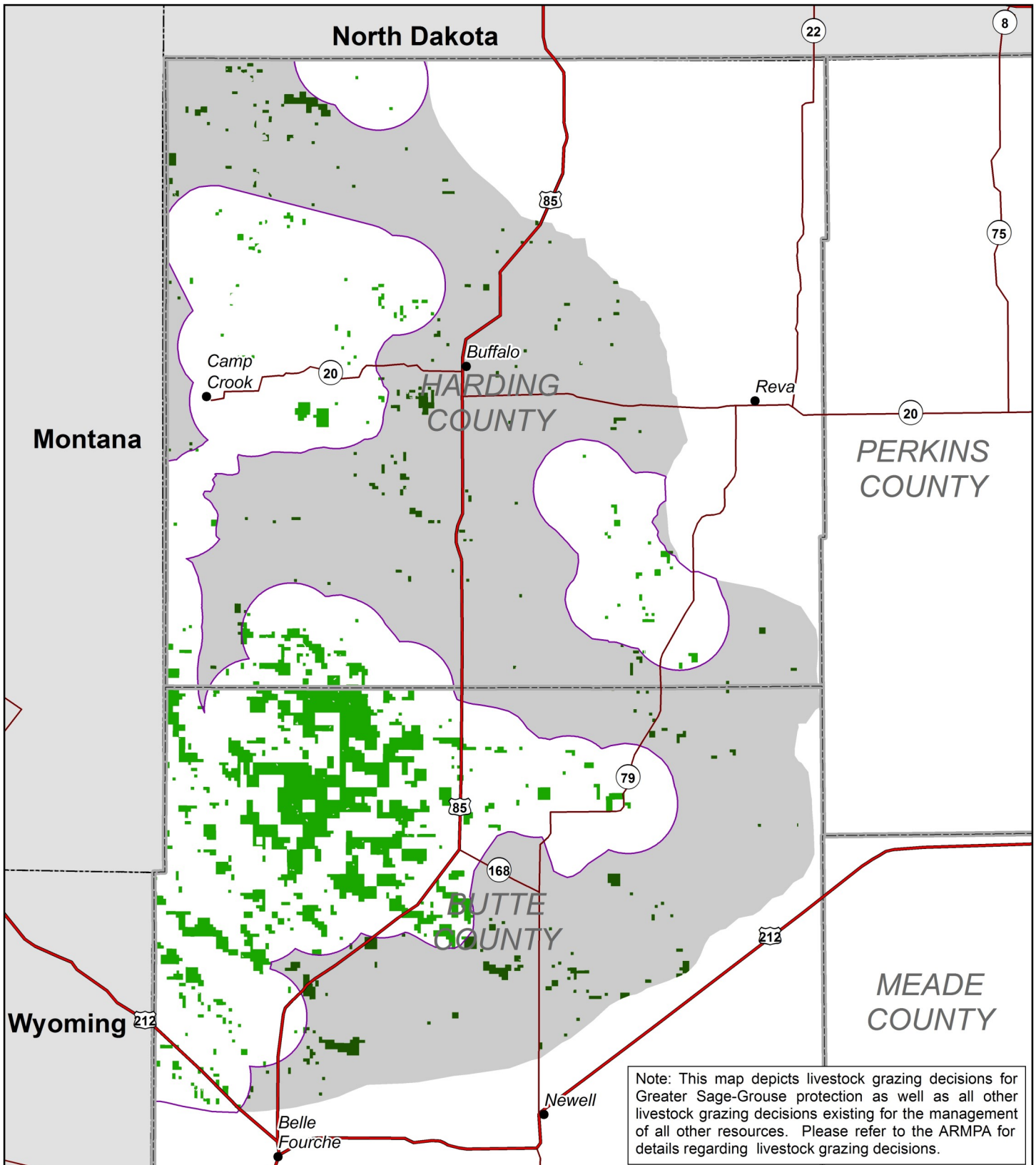
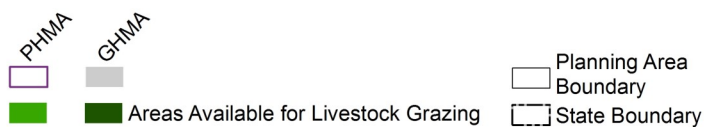


Figure 2-3: South Dakota Livestock Grazing



0 5 10 Miles

September 2015



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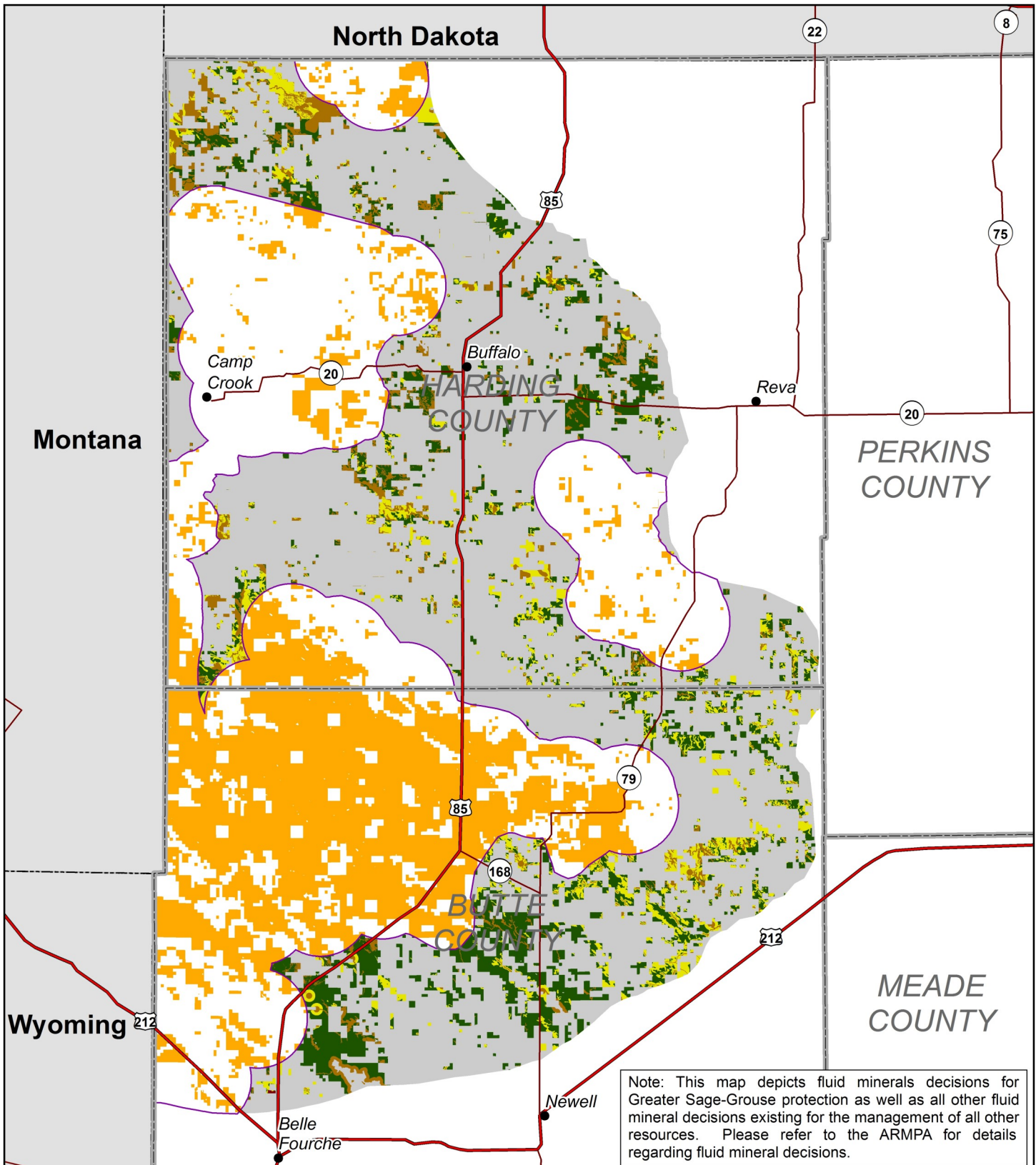
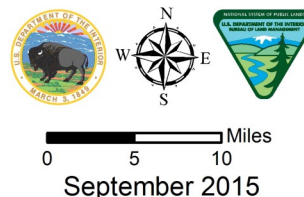
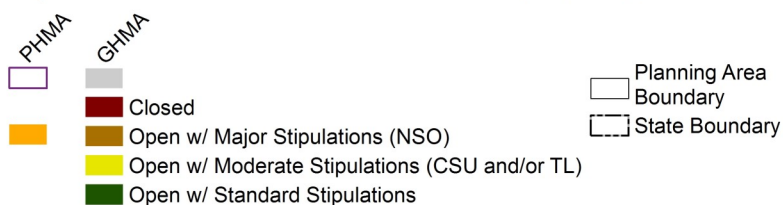


Figure 2-4: South Dakota Fluid Minerals (Oil, Gas, and Geothermal)



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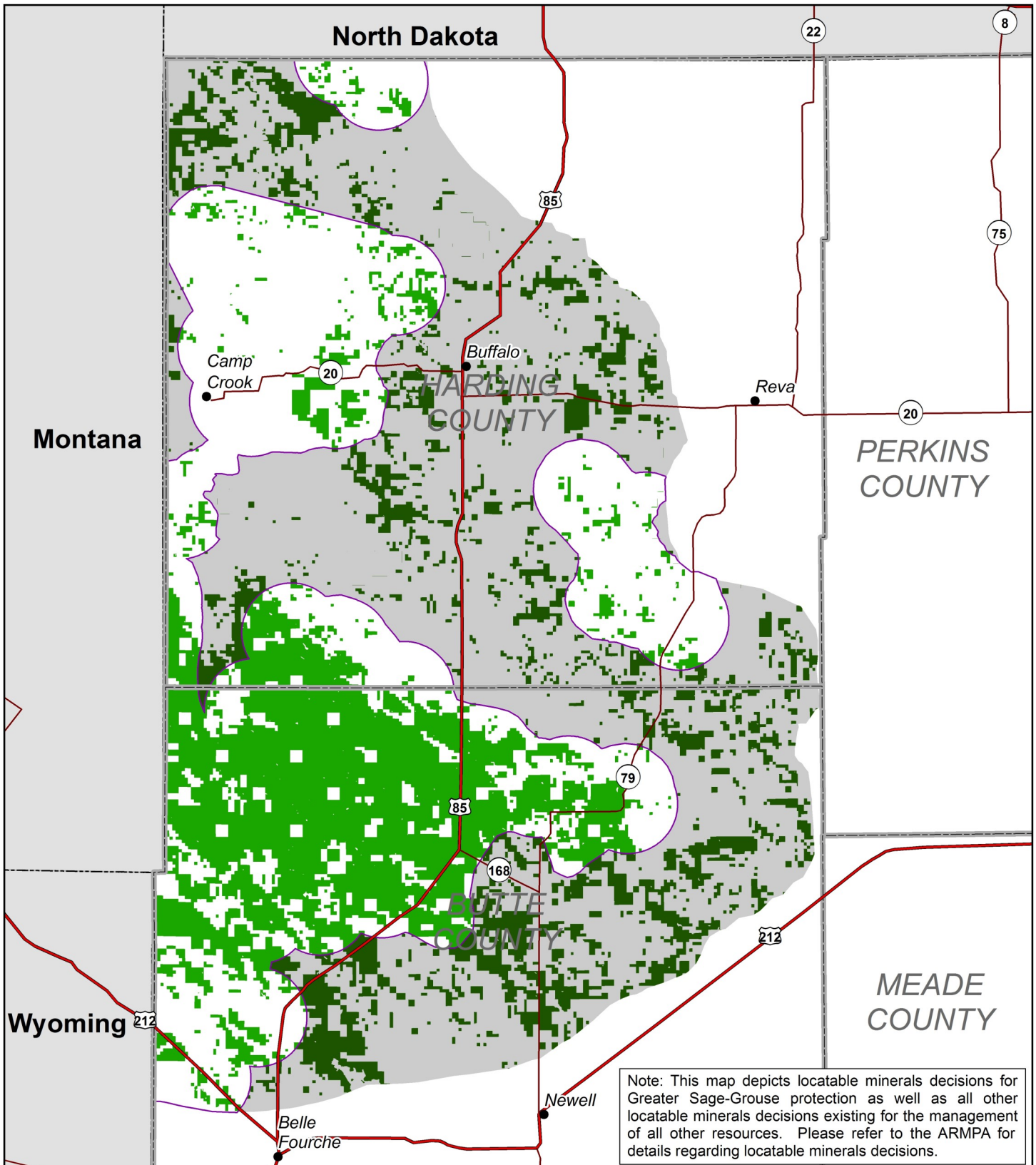


Figure 2-5: South Dakota Locatable Minerals

PHMA GHMA

Locatable Minerals Open

Locatable Minerals Closed

Planning Area Boundary

State Boundary



0 5 10 Miles

September 2015

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Map Area



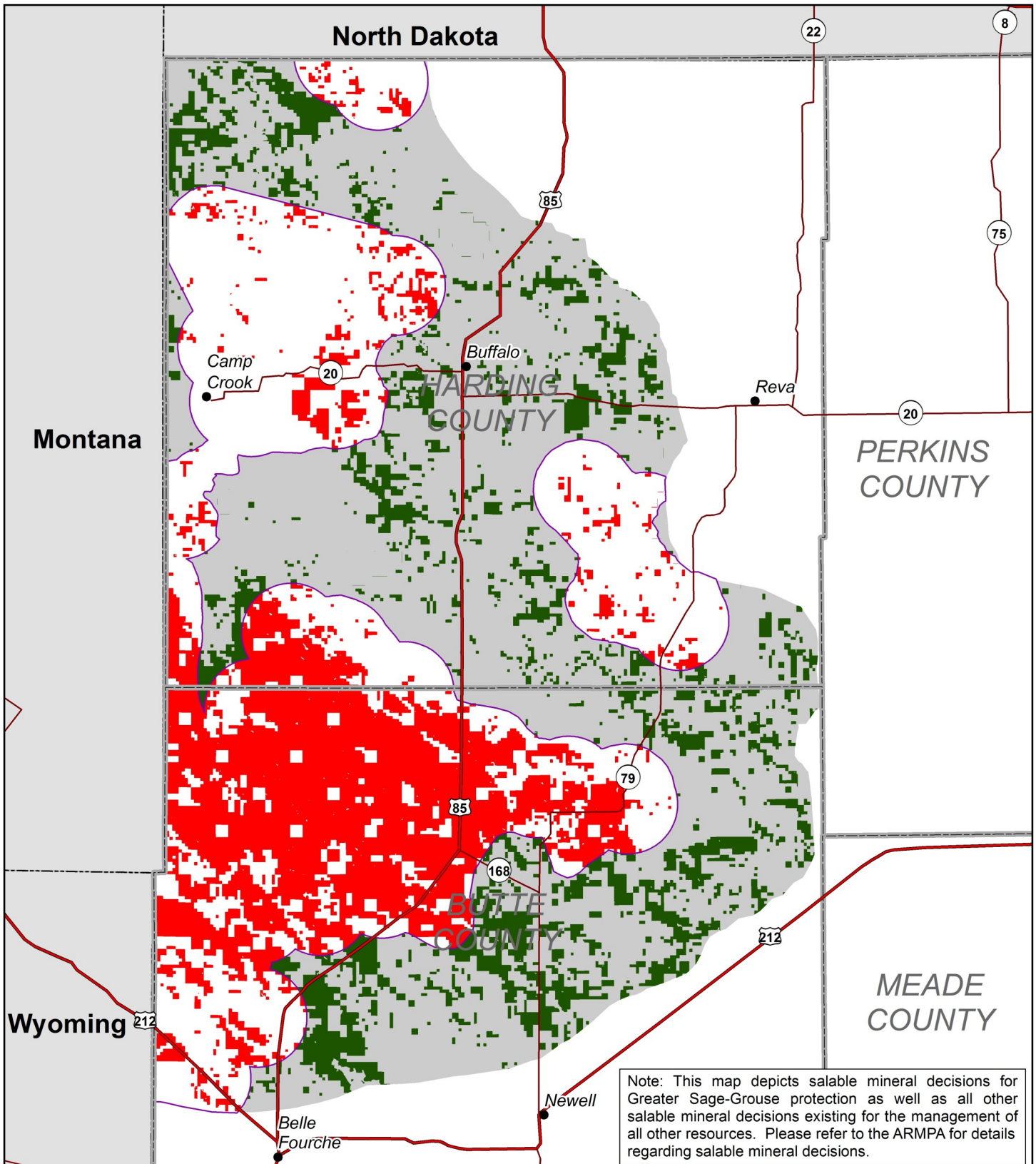


Figure 2-6: South Dakota Salable Minerals (Mineral Materials)

PHMA GHMA
 Closed
 Open

Planning Area
 Boundary
 State Boundary



0 5 10 Miles

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Map Area



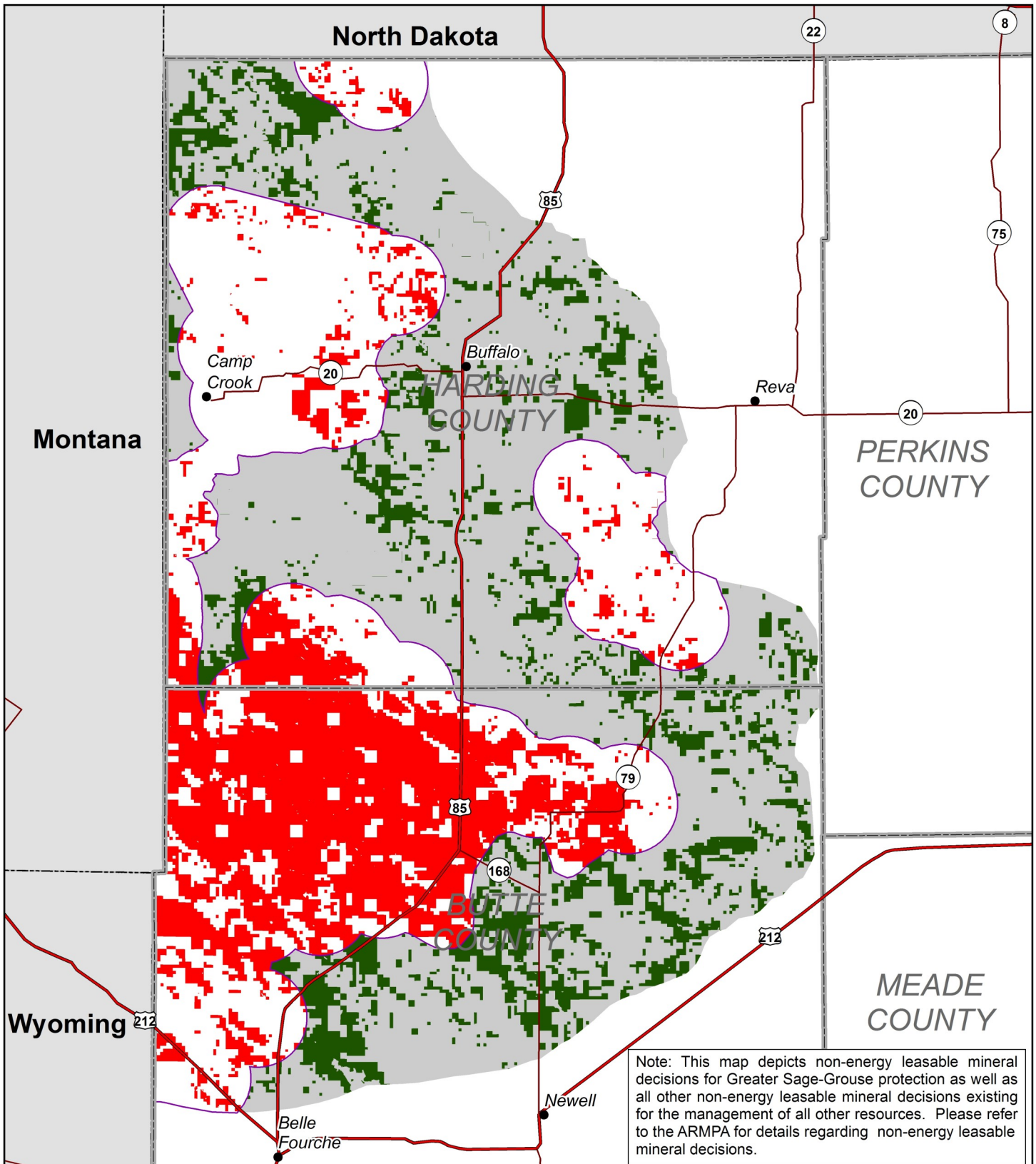


Figure 2-7: South Dakota Non-Energy Leasable Minerals

PHMA GHMA

Closed

Open

Planning Area

Boundary

State Boundary



0 5 10 Miles

September 2015

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Map Area



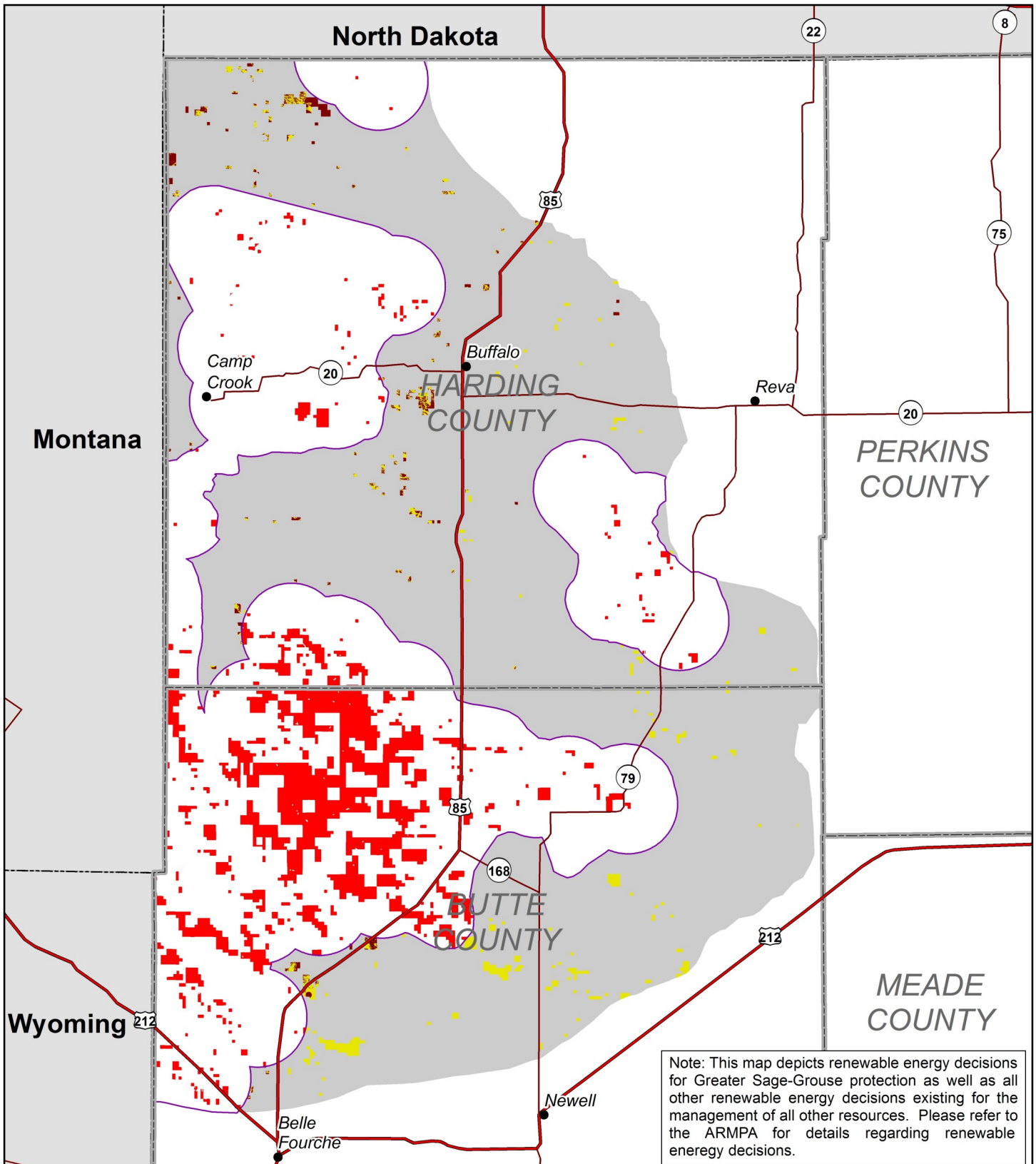


Figure 2-8: South Dakota Renewable Energy (Wind and Solar)

PHMA GHMA
 Exclusion
 Avoidance

Planning Area
 Boundary
 State Boundary



0 5 10 Miles

September 2015



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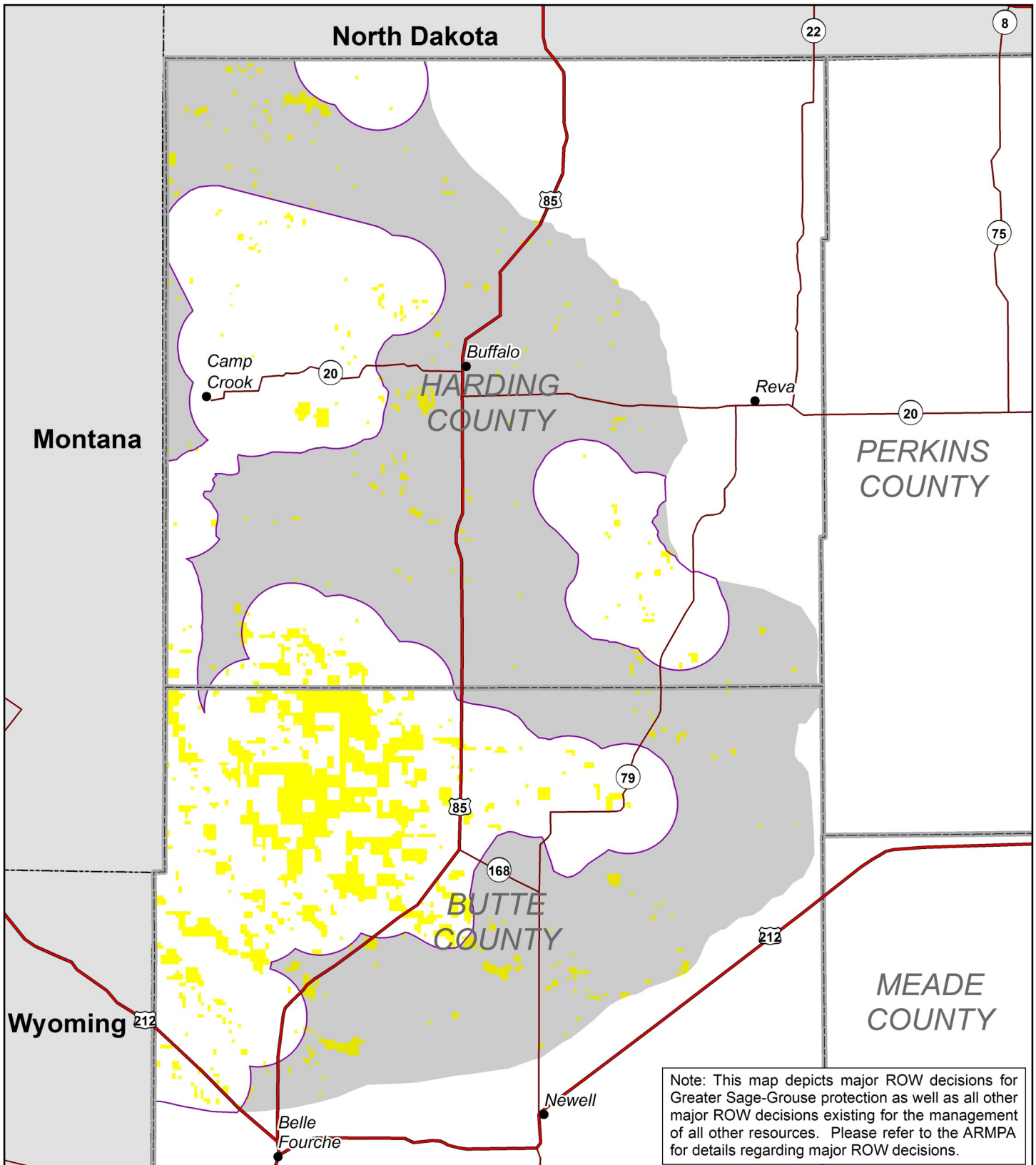


Figure 2-9a: South Dakota Major Rights-of-Way

PHMA GHMA
Avoidance

Planning Area
Boundary
State Boundary



0 5 10 Miles

September 2015

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Map Area



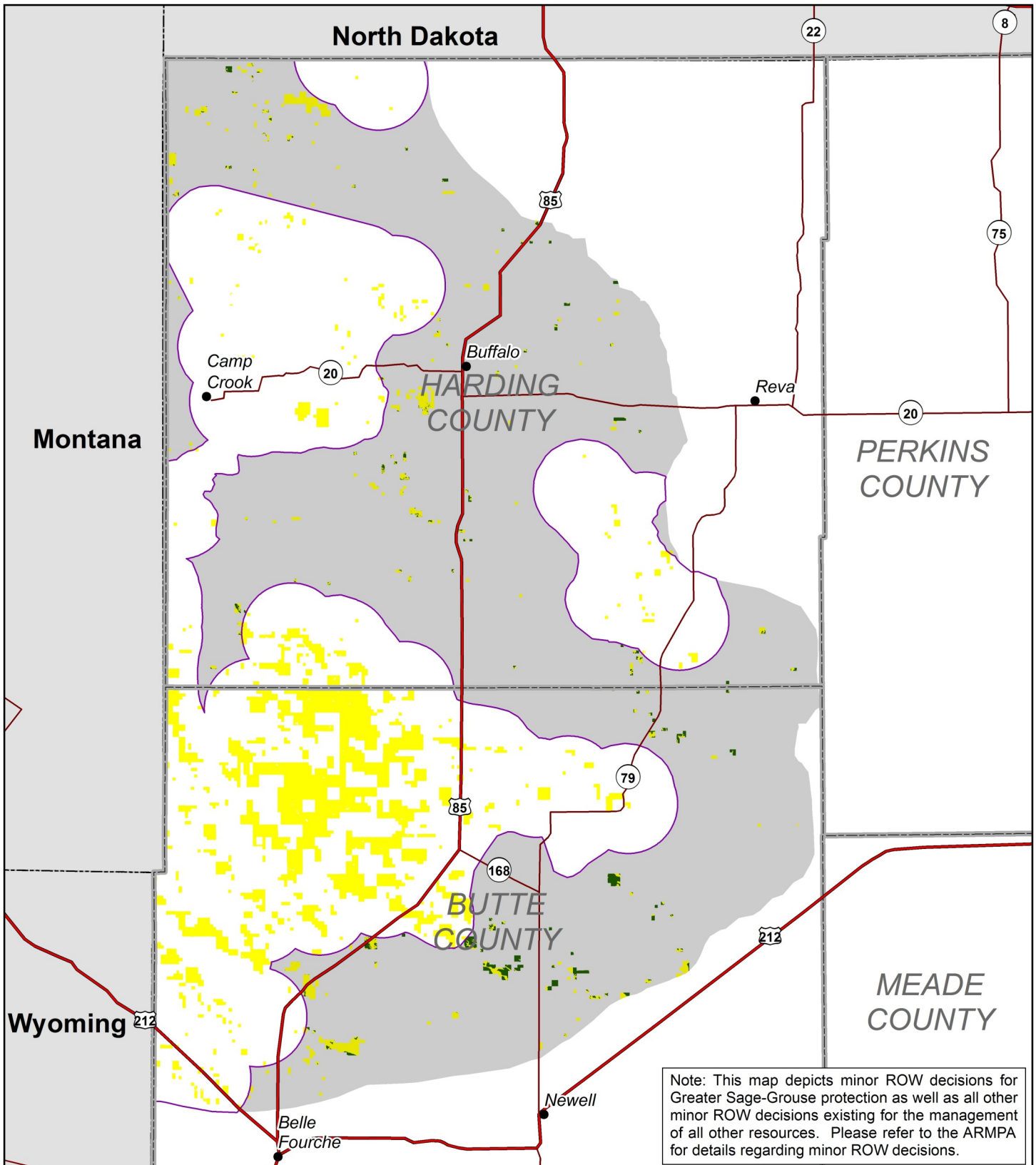


Figure 2-9b: South Dakota Minor Rights-of-Way

- PHMA GHMA
- Avoidance
- Open

- Planning Area Boundary
- State Boundary



0 5 10 Miles

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Map Area



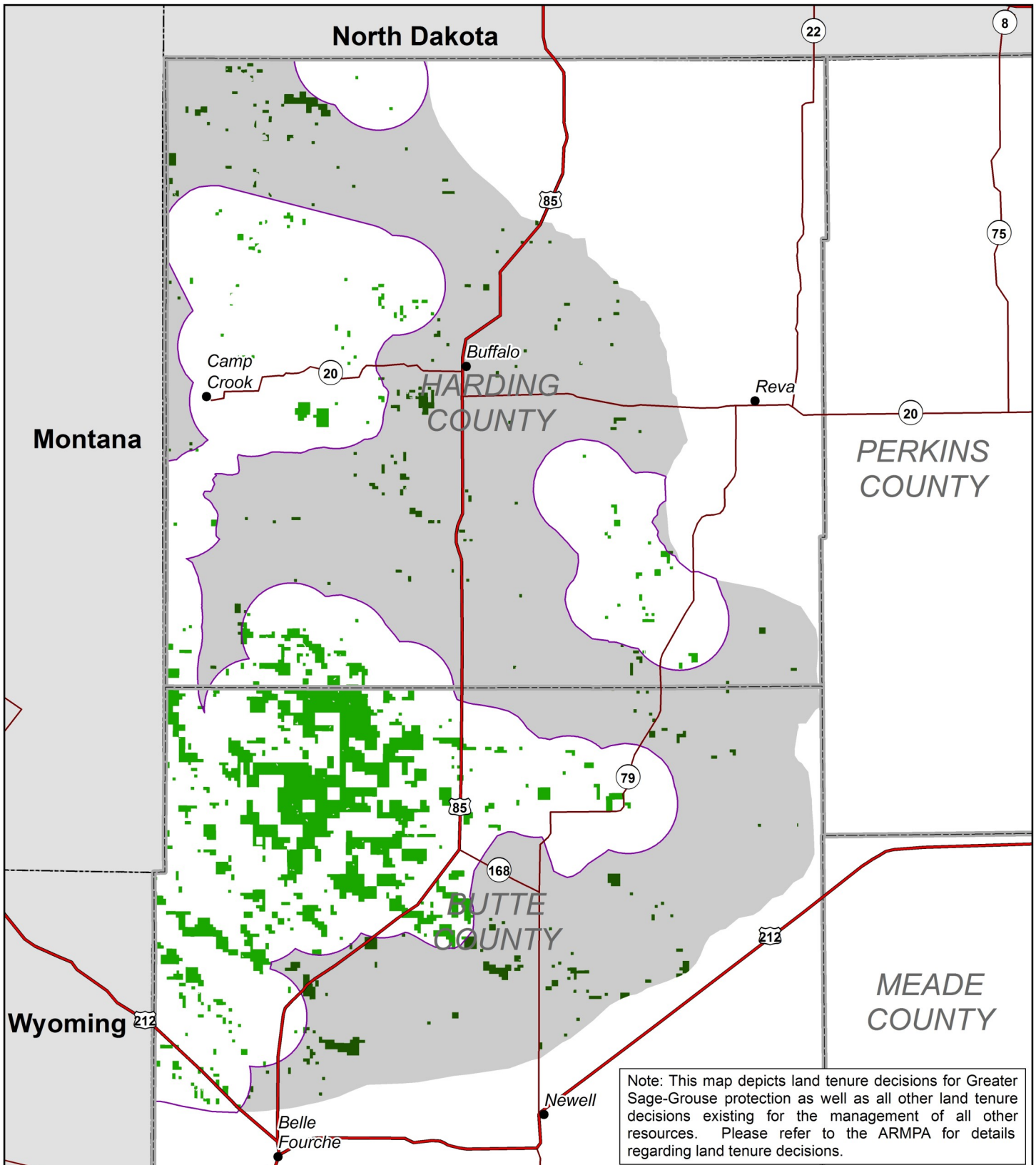


Figure 2-10: South Dakota Land Tenure



0 5 10 Miles

September 2015

Map Area



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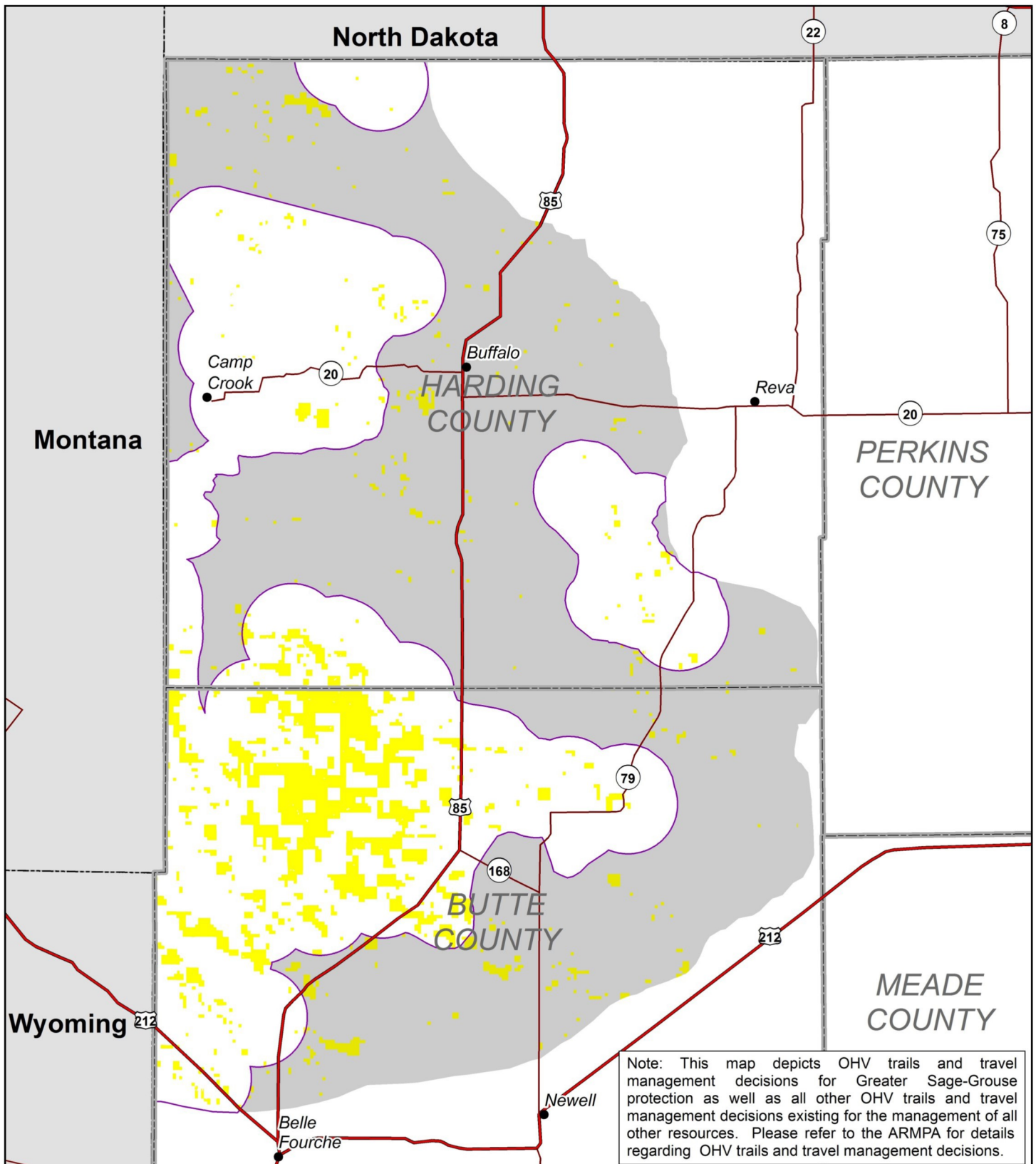
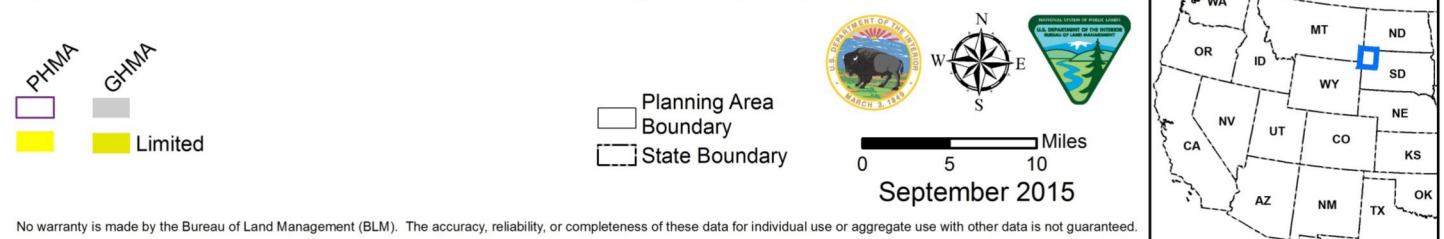
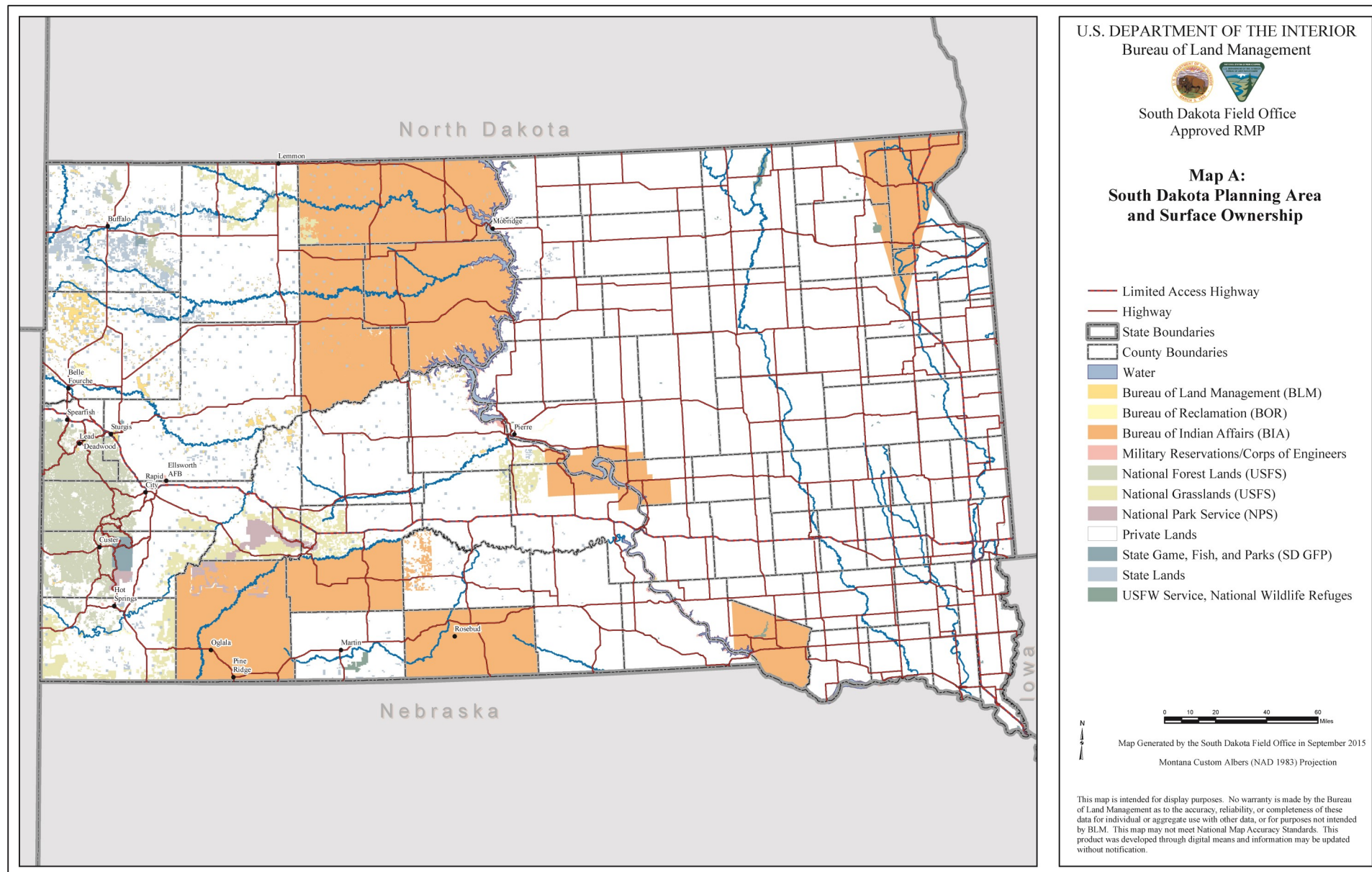


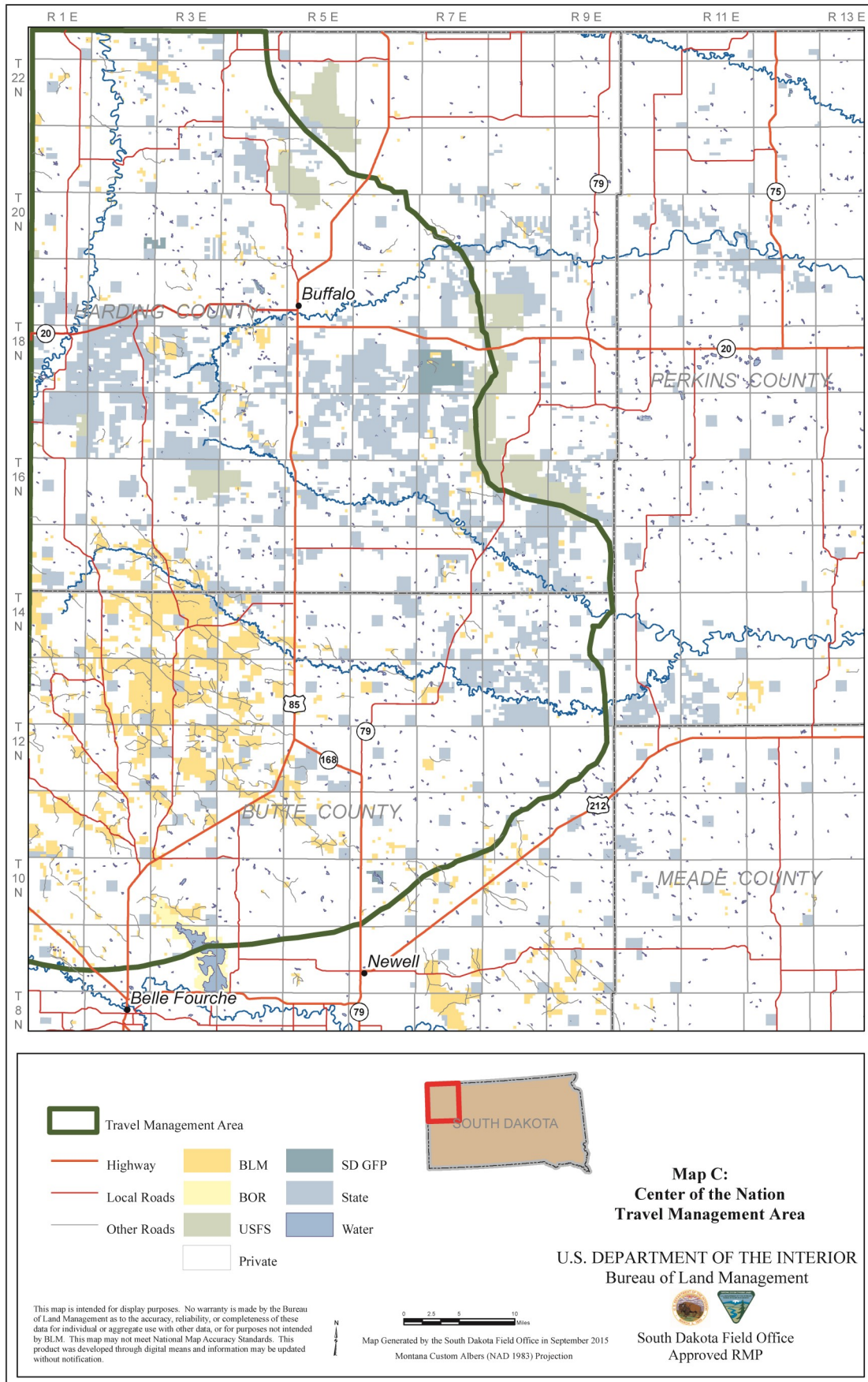
Figure 2-11: South Dakota Trails and Travel Management (OHV)

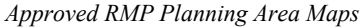


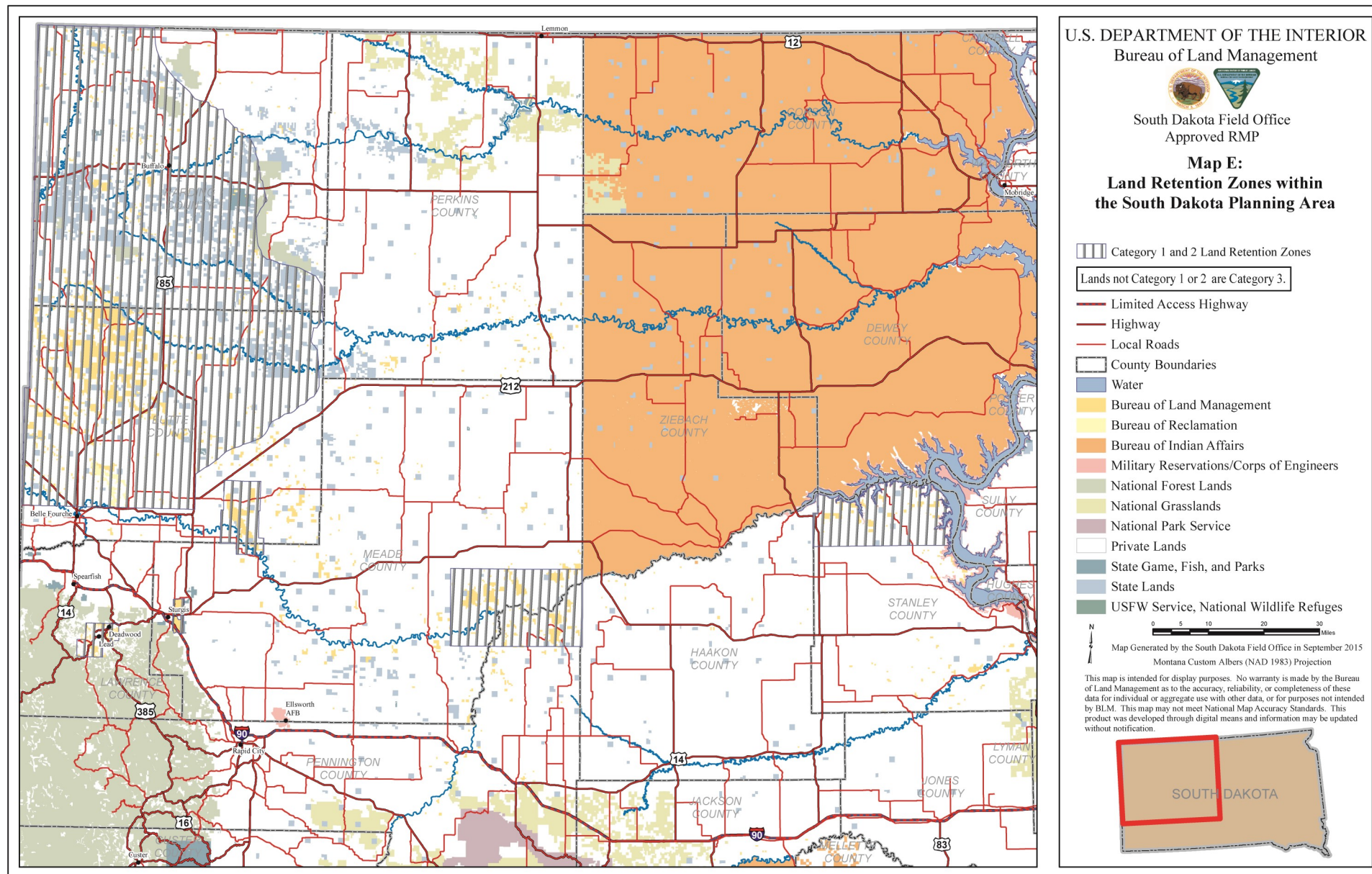
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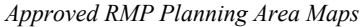


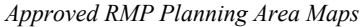




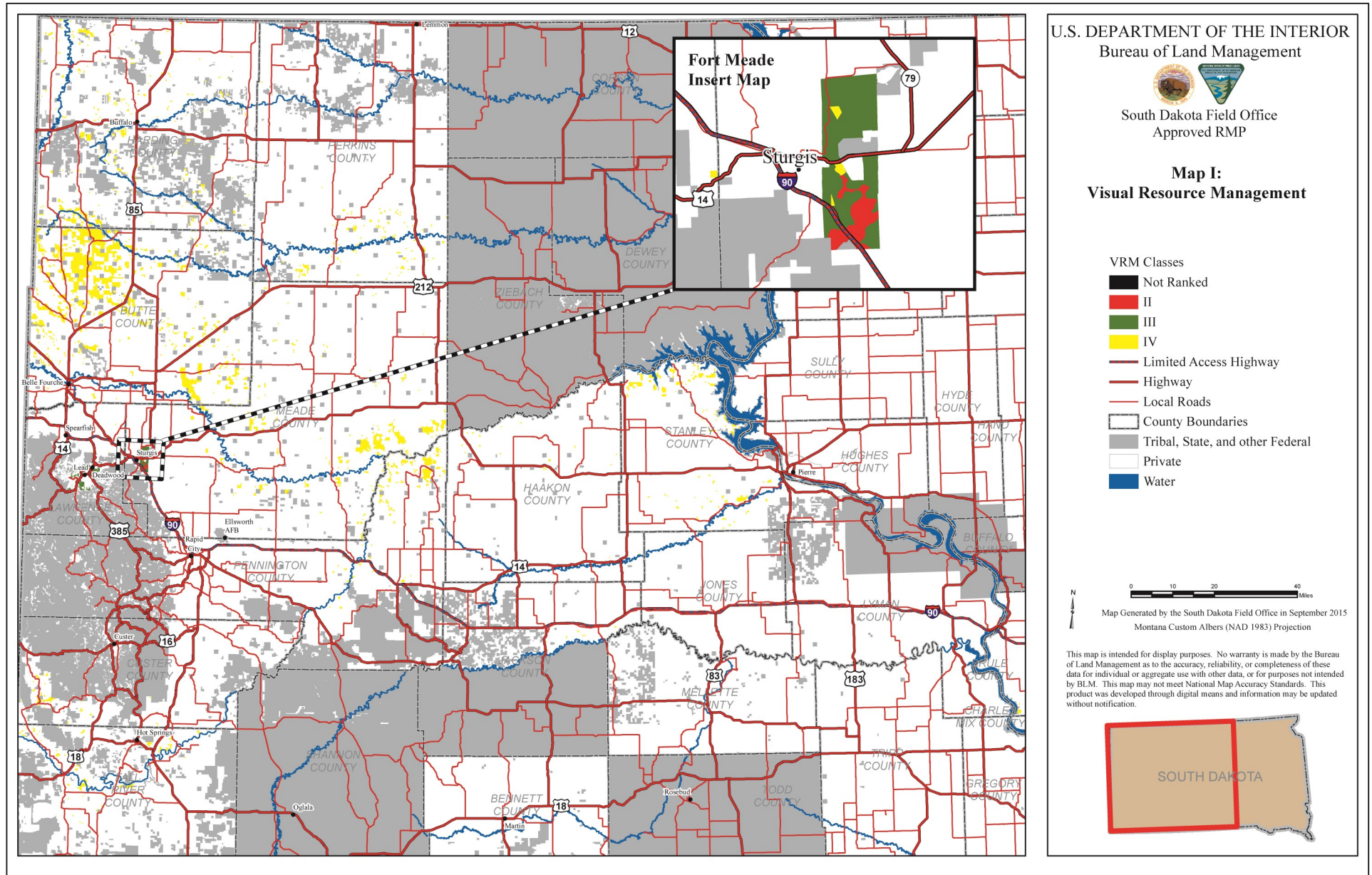


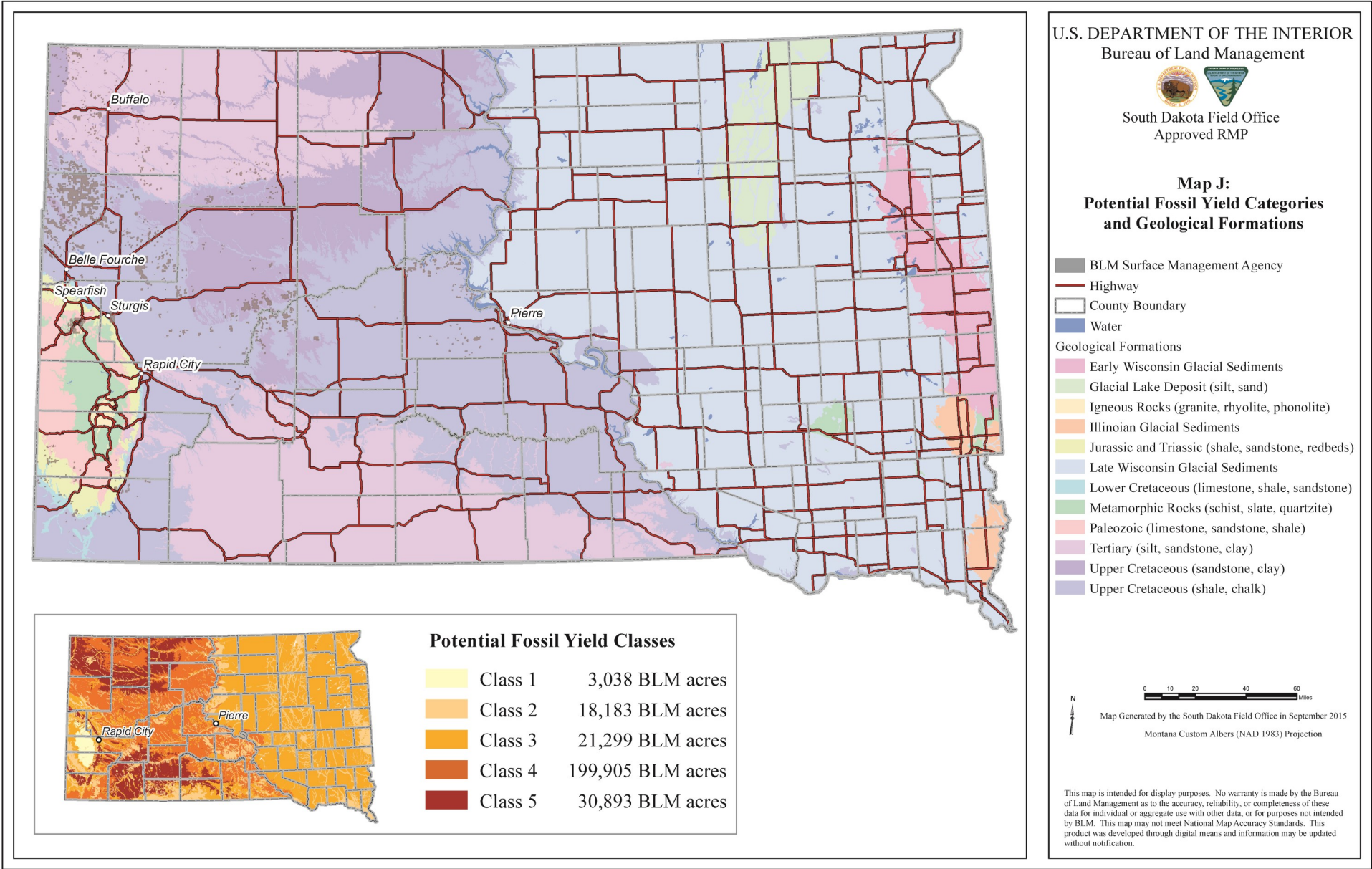












Appendix B

Applying Sage-Grouse Lek Buffer-Distances When Approving Actions

In November 2014, the USGS released their Report on Conservation Buffer Distance Estimates for Greater Sage-Grouse USGS Report – A Review ([Open File Report 2014-1239](#)). The purpose of this report is to provide a reference for land managers and others who are working to develop biologically relevant and socioeconomically practical buffer distances around sage-grouse habitats. The proposed plan imposes restrictions targeted to the individual threats to breeding and nesting activity in GRSG habitat. The findings of the Buffer Study have been incorporated into the Proposed Plan.

Buffer Distances and Evaluation of Impacts to Leks

Evaluate impacts to leks from actions requiring NEPA analysis. In addition to any other relevant information determined to be appropriate (e.g., State wildlife agency plans), the BLM will assess and address impacts from the following activities using the lek buffer-distances as identified in the USGS Report Conservation Buffer Distance Estimates for Greater Sage-Grouse – A Review ([Open File Report 2014-1239](#)). The BLM will apply the lek buffer-distances specified as the lower end of the interpreted range in the report unless justifiable departures are determined to be appropriate (see below). The lower end of the interpreted range of the lek buffer-distances is as follows:

- Linear features (roads) within 3.1 miles of leks
- Infrastructure related to energy development within 3.1 miles of leks
- Tall structures (e.g., communication or transmission towers, transmission lines) within 2 miles of leks
- Low structures (e.g., fences, rangeland structures) within 1.2 miles of leks
- Surface disturbance (continuing human activities that alter or remove the natural vegetation) within 3.1 miles of leks
- Noise and related disruptive activities, including those that do not result in habitat loss (e.g., motorized recreational events) at least 0.25 miles from leks

Justifiable departures to decrease or increase from these distances, based on local data, best available science, landscape features, and other existing protections (e.g., land use allocations, state regulations) may be appropriate for determining activity impacts. The USGS report recognized “that because of variation in populations, habitats, development patterns, social context, and other factors, for a particular disturbance type, there is no single distance that is an appropriate buffer for all populations and habitats across the sage-grouse range.” The USGS report also states that “various protection measures have been developed and implemented... [which have] the ability (alone or in concert with others) to protect important habitats, sustain populations, and support multiple-use demands for public lands.” All variations in lek buffer-distances will require appropriate analysis and disclosure as part of activity authorization.

In determining lek locations, the BLM will use the most recent active or occupied lek data available from the state wildlife agency.

For Actions in GHMA

The BLM will apply the lek buffer-distances identified above as required conservation measures to fully address the impacts on leks as identified in the NEPA analysis. Impacts should first be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.

- Impacts should first be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.

The BLM may approve actions in GHMA that are within the applicable lek buffer distance identified above only if:

- Based on best available science, landscape features, and other existing protections (e.g., land use allocations, state regulations), the BLM determines that a lek buffer-distance other than the applicable distance identified above offers the same or a greater level of protection to GRSG and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area; or
- The BLM determines that impacts on GRSG and its habitat are minimized such that the project will cause minor or no new disturbance (ex. co-location with existing authorizations); and
- Any residual impacts within the lek buffer-distances are addressed through compensatory mitigation measures sufficient to ensure a net conservation gain, as outlined in the Mitigation Strategy (Appendix F).

For Actions in PHMA

The BLM will apply the lek buffer-distances identified above as required conservation measures to fully address the impacts to leks as identified in the NEPA analysis. Impacts should be avoided by locating the action outside of the applicable lek buffer-distance(s) identified above.

The BLM may approve actions in PHMA that are within the applicable lek buffer distance identified above only if:

- The BLM, with input from the state fish and wildlife agency, determines, based on best available science, landscape features, and other existing protections, that a buffer distance other than the distance identified above offers the same or greater level of protection to GRSG and its habitat, including conservation of seasonal habitat outside of the analyzed buffer area.
- The BLM will explain its justification for determining the approved buffer distances meet these conditions in its project decision.
- Range improvements which do not impact GRSG, or, range improvements which provide a conservation benefit to GRSG such as fences for protecting important seasonal habitats, meet the lek buffer requirement.
- The BLM will explain its justification for determining the approved buffer distances meet these conditions in its project decision.

Appendix C

Greater Sage-Grouse Required Design Features

This appendix includes the Required Design Features for Greater Sage-Grouse Habitat. Required Design Features (RDFs) are required for certain activities in all GRSG habitat. RDFs establish the minimum specifications for certain activities to help mitigate adverse impacts. However, the applicability and overall effectiveness of each RDF cannot be fully assessed until the project level when the project location and design are known. Because of site-specific circumstances, some RDFs may not apply to some projects (e.g., a resource is not present on a given site) and/or may require slight variations (e.g., a larger or smaller protective area). All variations in RDFs would require that at least one of the following be demonstrated in the NEPA analysis associated with the project/activity:

- A specific RDF is documented to not be applicable to the site-specific conditions of the project/activity (e.g. due to site limitations or engineering considerations). Economic considerations, such as increased costs, do not necessarily require that an RDF be varied or rendered inapplicable;
- An alternative RDF is determined to provide equal or better protection for GRSG or its habitat;
- A specific RDF will provide no additional protection to GRSG or its habitat.

Required Design Features for how to make a pond that won't produce mosquitoes that transmit West Nile virus (from Doherty [2007])

1. Increase the size of ponds to accommodate a greater volume of water than is discharged. This will result in un-vegetated and muddy shorelines that breeding *Cx. tarsalis* avoid (De Szalay and Resh 2000). This modification may reduce *Cx. tarsalis* habitat but could create larval habitat for *Culicoides sonorensis*, a vector of blue tongue disease, and should be used sparingly (Schmidtman et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight et al. 2003).
2. Build steep shorelines to reduce shallow water (>60 centimeters [cm]) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species like *Cx. tarsalis* which prefer newly flooded sites with high primary productivity (Knight et al. 2003).
3. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce 5-10 fold fewer *Culex* mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).
4. Construct dams or impoundments that restrict down slope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage, or lining constructed ponds in areas where seepage is anticipated (Knight et al. 2003).
5. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.
6. Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.
7. Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.

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Required Design Features for Fluid Mineral Development

Priority Habitat Management Areas (PHMA)

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among right-of-way (ROW) holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Establish trip restrictions or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).
- Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.)
- Use dust abatement practices on roads and pads.
- Close and rehabilitate duplicate roads.

Operations

- Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- Use directional and horizontal drilling to reduce surface disturbance.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- Apply a phased development approach with concurrent reclamation.
- Place liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority areas (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.

- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury distribution power lines.
- Corridor power, flow, and small pipelines under or immediately adjacent to roads.
- Design or site permanent structures which create movement (e.g. a pump jack) to minimize impacts to sage-grouse.
- Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (e.g. by washing vehicles and equipment).
- Use only closed-loop systems for drilling operations and no reserve pits.
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
 - Overbuild size of ponds for muddy and non-vegetated shorelines.
 - Build steep shorelines to decrease vegetation and increase wave actions.
 - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
 - Construct dams or impoundments that restrict down slope seepage or overflow.
 - Line the channel where discharge water flows into the pond with crushed rock.
 - Construct spillway with steep sides and line it with crushed rock.
 - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
- The BLM would work with proponents to limit project-related noise where it would be expected to reduce functionality of habitats that support GRSG populations. The BLM would evaluate the potential for limitation of new noise sources on a case-by-case basis as appropriate.
- As additional research and information emerges, specific new limitations appropriate to the type of projects being considered would be evaluated, and appropriate limitations would be implemented where necessary to minimize potential for noise impacts on GRSG population behavioral cycles.
- As new research is completed, new specific limitations would be coordinated with the NDGF and partners. Noise levels at the perimeter of the lek should not exceed 10 dBA above ambient noise at sunrise at the perimeter of a lek during active lek season.
- Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.
- Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).
- Require sage-grouse-safe fences.
- Locate new compressor stations outside PHMA and design them to reduce noise that may be directed towards PHMA.
- Clean up refuse.
- Locate man camps outside of PHMA.

Reclamation

- Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs in reclamation practices/sites (Pyke 2011). Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.
- Irrigate interim reclamation if necessary for establishing seedlings more quickly.
- Utilize mulching techniques to expedite reclamation and to protect soils.

General Sage-Grouse Habitat Management Areas (GHMA)

- Make applicable BMPs mandatory as Conditions of Approval (COA) within GHMA. BMPs are continuously improving as new science and technology become available and therefore are subject to change. At a minimum include the following BMPs:

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances associated with operations and facilities as close as possible.
- Use directional and horizontal drilling to reduce surface disturbance.
- Clean up refuse.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Doherty 2007).

Reclamation

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites. Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.

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Required Design Features for Fire & Fuels

Fuels Management

1. Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patterns which most benefit sage-grouse habitat.
2. Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.
3. Use fire prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of hydrophobicity).
4. Ensure proposed sagebrush treatments are planned with interdisciplinary input from BLM and /or state wildlife agency biologist and that treatment acreage is conservative in the context of surrounding sage-grouse seasonal habitats and landscape.
5. Where appropriate, ensure that treatments are configured in a manner (e.g., strips) that promotes use by sage-grouse (See Connelly et al. 2000*)
6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.
7. Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.
8. Design vegetation treatment in areas of high frequency to facilitate firefighting safety, reduce the risk of extreme fire behavior; and to reduce the risk and rate of fire spread to key and restoration habitats.
9. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands first to sites which are adjacent to or surrounded by sage-grouse key habitats. Annual grasslands are second priority for restoration when the sites not adjacent to key habitat, but within two miles of key habitat. The third priority for annual grasslands habitat restoration projects are sites beyond two miles of key habitat. The intent is to focus restoration outward from existing, intact habitat.
10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs.
11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.
12. Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering, and brood rearing) to reduce the availability of perch sites for avian predators, as appropriate, and resources permit.
13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.
14. Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.
15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to aid in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).

Fire Management

1. Develop state-specific sage-grouse toolboxes containing maps, a list of resource advisors, contact information, local guidance, and other relevant information.

2. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing suppression tactics.
3. Assign a sage-grouse resource advisor to all extended attack fires in or near key sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.
4. On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.
5. During periods of multiple fires, ensure line officers are involved in setting priorities.
6. To the extent possible, locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, heli-bases) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.
7. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and all-terrain vehicles prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.
8. Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.
9. Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.
10. Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.
11. As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.

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Required Design Features for Solid Minerals (except Locatable)

Introduction

The following measures would be applied as RDFs for all solid minerals, except locatable minerals. The measures outlined below would be applied as recommended BMPs for locatable minerals. The RDFs or BMPs would be applied as appropriate in PHMA and GHMA, and to the extent allowable by law (i.e., to prevent unnecessary and undue degradation).

Roads

- Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.
- Locate roads to avoid important areas and habitats.
- Coordinate road construction and use among ROW holders.
- Construct road crossing at right angles to ephemeral drainages and stream crossings.
- Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.
- Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.
- Restrict vehicle traffic to only authorized users on newly constructed routes (e.g., use signing, gates, etc.)
- Use dust abatement practices on roads and pads.
- Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.

Operations

- Cluster disturbances associated with operations and facilities as close as possible.
- Place infrastructure in already disturbed locations where the habitat has not been restored.
- Restrict the construction of tall facilities and fences to the minimum number and amount needed.
- Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.

- Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.
- Bury power lines.
- Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.
- Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.
- Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).
- Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).
- Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat:
 - Overbuild size of ponds for muddy and non-vegetated shorelines.
 - Build steep shorelines to decrease vegetation and increase wave actions.
 - Avoid flooding terrestrial vegetation in flat terrain or low lying areas.
 - Construct dams or impoundments that restrict down slope seepage or overflow.
 - Line the channel where discharge water flows into the pond with crushed rock.
 - Construct spillway with steep sides and line it with crushed rock.
 - Treat waters with larvicides to reduce mosquito production where water occurs on the surface.
 - Require sage-grouse-safe fences around sumps.
 - Clean up refuse (Bui et al. 2010).
 - Locate man camps outside of PHMA.

Reclamation

- Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites.
- Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.
- Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.
- Irrigate interim reclamation as necessary during dry periods.
- Utilize mulching techniques to expedite reclamation.

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THE GREATER SAGE-GROUSE MONITORING FRAMEWORK

Bureau of Land Management
U.S. Forest Service

*Developed by
the Interagency
Greater
Sage-Grouse
Disturbance
and Monitoring
Subteam*

May 30, 2014

The Greater Sage-Grouse Monitoring Framework

Developed by the Interagency Greater Sage-Grouse Disturbance and Monitoring Subteam

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INTRODUCTION

The purpose of this U.S. Bureau of Land Management (BLM) and U.S. Forest Service (USFS) Greater Sage-Grouse Monitoring Framework (hereafter, monitoring framework) is to describe the methods to monitor habitats and evaluate the implementation and effectiveness of the BLM's national planning strategy (attachment to BLM Instruction Memorandum 2012-044), the BLM resource management plans (RMPs), and the USFS's land management plans (LMPs) to conserve the species and its habitat. The regulations for the BLM (43 CFR 1610.4-9) and the USFS (36 CFR part 209, published July 1, 2010) require that land use plans establish intervals and standards, as appropriate, for monitoring and evaluations based on the sensitivity of the resource to the decisions involved. Therefore, the BLM and the USFS will use the methods described herein to collect monitoring data and to evaluate implementation and effectiveness of the Greater Sage-Grouse (GRSG) (hereafter, sage-grouse) planning strategy and the conservation measures contained in their respective land use plans (LUPs). A monitoring plan specific to the Environmental Impact Statement, land use plan, or field office will be developed after the Record of Decision is signed. For a summary of the frequency of reporting, see Attachment A, An Overview of Monitoring Commitments. Adaptive management will be informed by data collected at any and all scales.

To ensure that the BLM and the USFS are able to make consistent assessments about sage-grouse habitats across the range of the species, this framework lays out the methodology—at multiple scales—for monitoring of implementation and disturbance and for evaluating the effectiveness of BLM and USFS actions to conserve the species and its habitat. Monitoring efforts will include data for measurable quantitative indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions. Implementation monitoring results will allow the BLM and the USFS to evaluate the extent that decisions from their LUPs to conserve sage-grouse and their habitat have been implemented. State fish and wildlife agencies will collect population monitoring information, which will be incorporated into effectiveness monitoring as it is made available.

This multiscale monitoring approach is necessary, as sage-grouse are a landscape species and conservation is scale-dependent to the extent that conservation actions are implemented within seasonal habitats to benefit populations. The four orders of habitat selection (Johnson 1980) used in this monitoring framework are described by Connelly et al. (2003) and were applied specifically to the scales of sage-grouse habitat selection by Stiver et al. (*in press*) as first order (broad scale), second order (mid scale), third order (fine scale), and fourth order (site scale). Habitat selection and habitat use by sage-grouse occur at multiple scales and are driven by multiple environmental and behavioral factors. Managing and monitoring sage-grouse habitats are complicated by the differences in habitat selection across the range and habitat use by individual birds within a given season. Therefore, the tendency to look at a single indicator of habitat suitability or only one scale limits managers' ability to identify the threats to sage-grouse

and to respond at the appropriate scale. For descriptions of these habitat suitability indicators for each scale, see “Sage-Grouse Habitat Assessment Framework: Multiscale Habitat Assessment Tool” (HAF; Stiver et al. *in press*).

Monitoring methods and indicators in this monitoring framework are derived from the current peer-reviewed science. Rangewide, best available datasets for broad- and mid-scale monitoring will be acquired. If these existing datasets are not readily available or are inadequate, but they are necessary to inform the indicators of sagebrush availability, anthropogenic disturbance levels, and sagebrush conditions, the BLM and the USFS will strive to develop datasets or obtain information to fill these data gaps. Datasets that are not readily available to inform the fine- and site-scale indicators will be developed. These data will be used to generate monitoring reports at the appropriate and applicable geographic scales, boundaries, and analysis units: across the range of sage-grouse as defined by Schroeder et al. (2004), and clipped by Western Association of Fish and Wildlife Agencies (WAFWA) Management Zone (MZ) (Stiver et al. 2006) boundaries and other areas as appropriate for size (e.g., populations based on Connelly et al. 2004). (See Figure 1, Map of Greater Sage-Grouse range, populations, subpopulations, and Priority Areas for Conservation as of 2013.) This broad- and mid-scale monitoring data and analysis will provide context for RMP/LMP areas; states; GRSG Priority Habitat, General Habitat, and other sage-grouse designated management areas; and Priority Areas for Conservation (PACs), as defined in “Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report” (Conservation Objectives Team [COT] 2013). Hereafter, all of these areas will be referred to as “sage-grouse areas.”

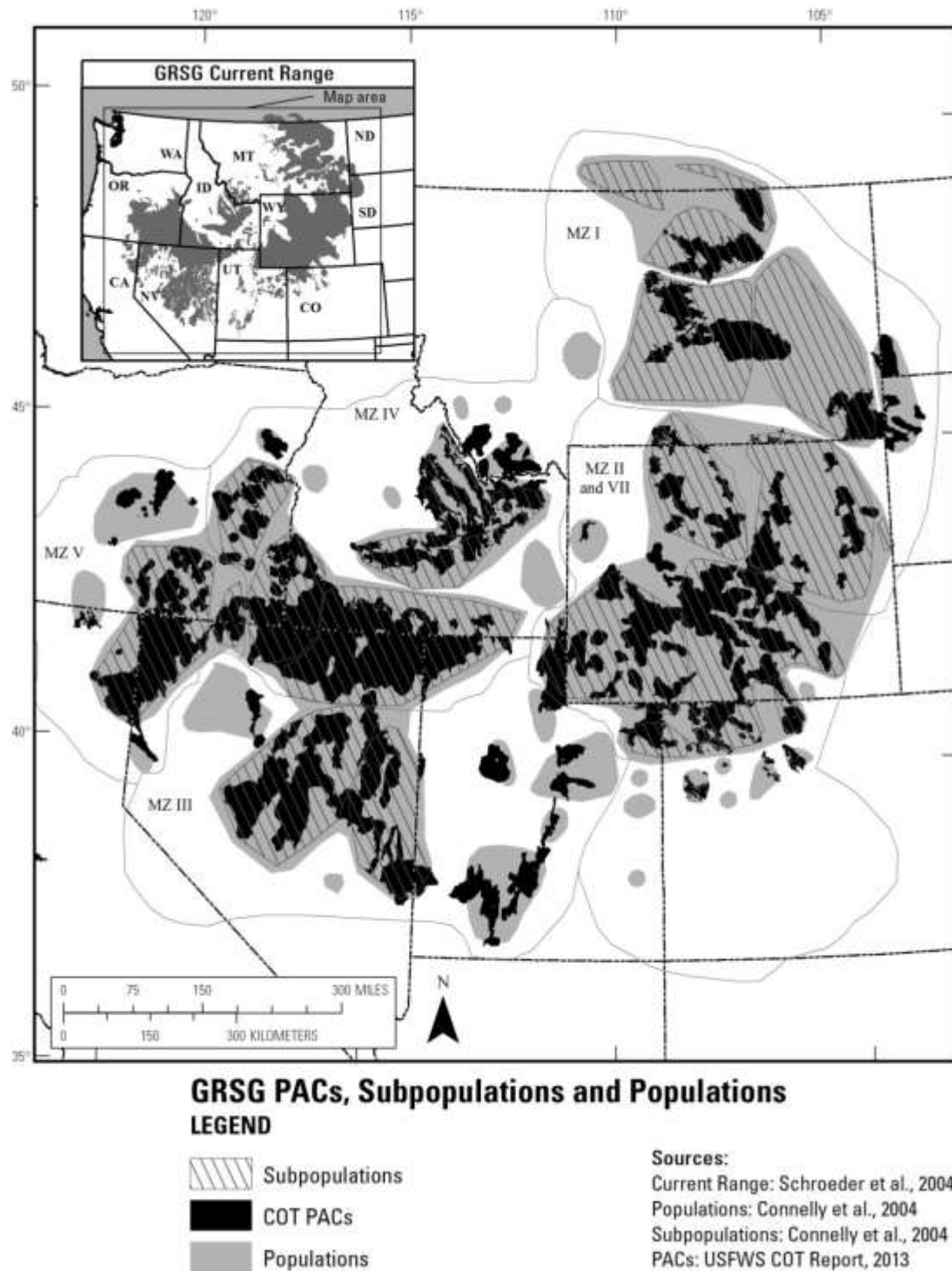


Figure 1. Map of Greater Sage-Grouse range, populations, subpopulations, and Priority Areas for Conservation as of 2013.

This monitoring framework is divided into two sections. The broad- and mid-scale methods, described in Section I, provide a consistent approach across the range of the species to monitor implementation decisions and actions, mid-scale habitat attributes (e.g., sagebrush availability and habitat degradation), and population changes to determine the effectiveness of the planning strategy and management decisions. (See Table 1, Indicators for monitoring implementation of the national planning strategy, RMP/LMP decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid scales.) For sage-grouse habitat at the fine and site scales, described in Section II, this monitoring framework describes a consistent approach (e.g., indicators and methods) for monitoring sage-grouse seasonal habitats. Funding, support, and dedicated personnel for broad- and mid-scale monitoring will be renewed annually through the normal budget process. For an overview of BLM and USFS multiscale monitoring commitments, see Attachment A.

Table 1. Indicators for monitoring implementation of the national planning strategy, RMP/LMP decisions, sage-grouse habitat, and sage-grouse populations at the broad and mid scales.

Implementation		Habitat		Population (State Wildlife Agencies)
<i>Geographic Scales</i>		Availability	Degradation	Demographics
Broad Scale: From the range of sage- grouse to WAFWA Management Zones	BLM/USFS National planning strategy goal and objectives	Distribution and amount of sagebrush within the range	Distribution and amount of energy, mining, and infrastructure facilities	WAFWA Management Zone population trend
Mid Scale: From WAFWA Management Zone to populations; PACs	RMP/LMP decisions	Mid-scale habitat indicators (HAF; Table 2 herein, e.g., percent of sagebrush per unit area)	Distribution and amount of energy, mining, and infrastructure facilities (Table 2 herein)	Individual population trend

I. BROAD AND MID SCALES

First-order habitat selection, the broad scale, describes the physical or geographical range of a species. The first-order habitat of the sage-grouse is defined by populations of sage-grouse associated with sagebrush landscapes, based on Schroeder et al. 2004, and Connelly et al. 2004, and on population or habitat surveys since 2004. An intermediate scale between the broad and mid scales was delineated by WAFWA from floristic provinces within which similar environmental factors influence vegetation communities. This scale is referred to as the WAFWA Sage-Grouse Management Zones (MZs). Although no indicators are specific to this scale, these MZs are biologically meaningful as reporting units.

Second-order habitat selection, the mid-scale, includes sage-grouse populations and PACs. The second order includes at least 40 discrete populations and subpopulations (Connelly et al. 2004). Populations range in area from 150 to 60,000 mi² and are nested within MZs. PACs range from 20 to 20,400 mi² and are nested within population areas.

Other mid-scale landscape indicators, such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*) will also be assessed. The methods used to calculate these metrics will be derived from existing literature (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011).

A. Implementation (Decision) Monitoring

Implementation monitoring is the process of tracking and documenting the implementation (or the progress toward implementation) of RMP/LMP decisions. The BLM and the USFS will monitor implementation of project-level and/or site-specific actions and authorizations, with their associated conditions of approval/stipulations for sage-grouse, spatially (as appropriate) within Priority Habitat, General Habitat, and other sage-grouse designated management areas, at a minimum, for the planning area. These actions and authorizations, as well as progress toward completing and implementing activity-level plans, will be monitored consistently across all planning units and will be reported to BLM and USFS headquarters annually, with a summary report every 5 years, for the planning area. A national-level GRSG Land Use Plan Decision Monitoring and Reporting Tool is being developed to describe how the BLM and the USFS will consistently and systematically monitor and report implementation-level activity plans and implementation actions for all plans within the range of sage-grouse. A description of this tool for collection and reporting of tabular and spatially explicit data will be included in the Record of Decision or approved plan. The BLM and the USFS will provide data that can be integrated with other conservation efforts conducted by state and federal partners.

B. Habitat Monitoring

The U.S. Fish and Wildlife Service (USFWS), in its 2010 listing decision for the sage-grouse, identified 18 threats contributing to the destruction, modification, or curtailment of sage-grouse habitat or range (75 FR 13910 2010). The BLM and the USFS will, therefore, monitor the relative extent of these threats that remove sagebrush, both spatially and temporally, on all lands within an analysis area, and will report on amount, pattern, and condition at the appropriate and applicable geographic scales and boundaries. These 18 threats have been aggregated into three broad- and mid-scale measures to account for whether the threat predominantly removes sagebrush or degrades habitat. (See Table 2, Relationship between the 18 threats and the three habitat disturbance measures for monitoring.) The three measures are:

Measure 1: Sagebrush Availability (percent of sagebrush per unit area)

Measure 2: Habitat Degradation (percent of human activity per unit area)

Measure 3: Energy and Mining Density (facilities and locations per unit area)

These three habitat disturbance measures will evaluate disturbance on all lands, regardless of land ownership. The direct area of influence will be assessed with the goal of accounting for actual removal of sagebrush on which sage-grouse depend (Connelly et al. 2000) and for habitat degradation as a surrogate for human activity. Measure 1 (sagebrush availability) examines where disturbances have removed plant communities that support sagebrush (or have broadly removed sagebrush from the landscape). Measure 1, therefore, monitors the change in sagebrush availability—or, specifically, where and how much of the sagebrush community is available within the range of sage-grouse. The sagebrush community is defined as the ecological systems that have the capability of supporting sagebrush vegetation and seasonal sage-grouse habitats within the range of sage-grouse (see Section I.B.1., Sagebrush Availability). Measure 2 (see Section I.B.2., Habitat Degradation Monitoring) and Measure 3 (see Section I.B.3., Energy and Mining Density) focus on where habitat degradation is occurring by using the footprint/area of direct disturbance and the number of facilities at the mid scale to identify the relative amount of degradation per geographic area of interest and in areas that have the capability of supporting sagebrush and seasonal sage-grouse use. Measure 2 (habitat degradation) not only quantifies footprint/area of direct disturbance but also establishes a surrogate for those threats most likely to have ongoing activity. Because energy development and mining activities are typically the most intensive activities in sagebrush habitat, Measure 3 (the density of active energy development, production, and mining sites) will help identify areas of particular concern for such factors as noise, dust, traffic, etc. that degrade sage-grouse habitat.

Table 2. Relationship between the 18 threats and the three habitat disturbance measures for monitoring.

Note: Data availability may preclude specific analysis of individual layers. See the detailed methodology for more information.

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and saleable developments)		X	X
Infrastructure (roads)		X	
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights-of-way		X	

The methods to monitor disturbance found herein differ slightly from methods used in Manier et al. 2013, which provided a baseline environmental report (BER) of datasets of disturbance across jurisdictions. One difference is that, for some threats, the BER data were for federal lands only. In addition, threats were assessed individually, using different assumptions from those in this monitoring framework about how to quantify the location and magnitude of threats. The methodology herein builds on the BER methodology and identifies datasets and procedures to use the best available data across the range of the sage-grouse and to formulate a consistent approach to quantify impact of the threats through time. This methodology also describes an approach to combine the threats and calculate each of the three habitat disturbance measures.

B.1. Sagebrush Availability (Measure 1)

Sage-grouse populations have been found to be more resilient where a percentage of the landscape is maintained in sagebrush (Knick and Connelly 2011), which will be determined by sagebrush availability. Measure 1 has been divided into two submeasures to describe sagebrush availability on the landscape:

Measure 1a: the current amount of sagebrush on the geographic area of interest, and

Measure 1b: the amount of sagebrush on the geographic area of interest compared with the amount of sagebrush the landscape of interest could ecologically support.

Measure 1a (the current amount of sagebrush on the landscape) will be calculated using this formula: [the existing updated sagebrush layer] divided by [the geographic area of interest]. The appropriate geographic areas of interest for sagebrush availability include the species' range, WAFWA MZs, populations, and PACs. In some cases these sage-grouse areas will need to be aggregated to provide an estimate of sagebrush availability with an acceptable level of accuracy.

Measure 1b (the amount of sagebrush for context within the geographic area of interest) will be calculated using this formula: [existing sagebrush divided by [pre-EuroAmerican settlement geographic extent of lands that could have supported sagebrush]]. This measure will provide information to set the context for a given geographic area of interest during evaluations of monitoring data. The information could also be used to inform management options for restoration or mitigation and to inform effectiveness monitoring.

The sagebrush base layer for Measure 1 will be based on geospatial vegetation data adjusted for the threats listed in Table 2. The following subsections of this monitoring framework describe the methodology for determining both the current availability of sagebrush on the landscape and the context of the amount of sagebrush on the landscape at the broad and mid scales.

a. Establishing the Sagebrush Base Layer

The current geographic extent of sagebrush vegetation within the rangewide distribution of sage-grouse populations will be ascertained using the most recent version of the Existing Vegetation Type (EVT) layer in LANDFIRE (2013). LANDFIRE EVT was selected to serve as the sagebrush base layer for five reasons: 1) it is the only nationally consistent vegetation layer that has been updated multiple times since 2001; 2) the ecological systems classification within LANDFIRE EVT includes multiple sagebrush type classes that, when aggregated, provide a more accurate (compared with individual classes) and seamless sagebrush base layer across jurisdictional boundaries; 3) LANDFIRE performed a rigorous accuracy assessment from which to derive the rangewide uncertainty of the sagebrush base layer; 4) LANDFIRE is consistently used in several recent analyses of sagebrush habitats (Knick et al. 2011, Leu and Hanser 2011, Knick and Hanser 2011); and 5) LANDFIRE EVT can be compared against the geographic extent of lands that are believed to have had the capability of supporting sagebrush vegetation pre-EuroAmerican settlement [LANDFIRE Biophysical Setting (BpS)]. This fifth reason provides a reference point for understanding how much sagebrush currently remains in a defined geographic area of interest compared with how much sagebrush existed historically (Measure 1b). Therefore, the BLM and the USFS have determined that LANDFIRE provides the best available data at broad and mid scales to serve as a sagebrush base layer for monitoring changes in the geographic extent of sagebrush. The BLM and the USFS, in addition to aggregating the sagebrush types into the sagebrush base layer, will aggregate the accuracy assessment reports from LANDFIRE to document the cumulative accuracy for the sagebrush base layer. The BLM—through its Assessment, Inventory, and Monitoring (AIM) program and, specifically, the BLM’s landscape monitoring framework (Taylor et al. 2014)—will provide field data to the LANDFIRE program to support continuous quality improvements of the LANDFIRE EVT layer. The sagebrush layer based on LANDFIRE EVT will allow for the mid-scale estimation of the existing percent of sagebrush across a variety of reporting units. This sagebrush base layer will be adjusted by changes in land cover and successful restoration for future calculations of sagebrush availability (Measures 1a and 1b).

This layer will also be used to determine the trend in other landscape indicators, such as patch size and number, patch connectivity, linkage areas, and landscape matrix and edge effects (Stiver et al. *in press*). In the future, changes in sagebrush availability, generated annually, will be included in the sagebrush base layer. The landscape metrics will be recalculated to examine changes in pattern and abundance of sagebrush at the various geographic boundaries. This information will be included in effectiveness monitoring (See Section I.D., Effectiveness Monitoring).

Within the USFS and the BLM, forest-wide and field office–wide existing vegetation classification mapping and inventories are available that provide a much finer level of data than what is provided through LANDFIRE. Where available, these finer-scale products will be useful for additional and complementary mid-scale indicators and local-scale analyses (see Section II,

Fine and Site Scales). The fact that these products are not available everywhere limits their utility for monitoring at the broad and mid scale, where consistency of data products is necessary across broader geographies.

Data Sources for Establishing and Monitoring Sagebrush Availability

There were three criteria for selecting the datasets for establishing and monitoring the change in sagebrush availability (Measure 1):

- Nationally consistent dataset available across the range
- Known level of confidence or accuracy in the dataset
- Continual maintenance of dataset and known update interval

Datasets meeting these criteria are listed in Table 3, Datasets for establishing and monitoring changes in sagebrush availability.

LANDFIRE Existing Vegetation Type (EVT) Version 1.2

LANDFIRE EVT represents existing vegetation types on the landscape derived from remote sensing data. Initial mapping was conducted using imagery collected in approximately 2001. Since the initial mapping there have been two update efforts: version 1.1 represents changes before 2008, and version 1.2 reflects changes on the landscape before 2010. Version 1.2 will be used as the starting point to develop the sagebrush base layer.

Sage-grouse subject matter experts determined which of the ecological systems from the LANDFIRE EVT to use in the sagebrush base layer by identifying the ecological systems that have the capability of supporting sagebrush vegetation and that could provide suitable seasonal habitat for the sage-grouse. (See Table 4, Ecological systems in BpS and EVT capable of supporting sagebrush vegetation and capable of providing suitable seasonal habitat for Greater Sage-Grouse.) Two additional vegetation types that are not ecological systems were added to the EVT: *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance. These alliances have species composition directly related to the Rocky Mountain Lower Montane-Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system, both of which are ecological systems in LANDFIRE BpS. In LANDFIRE EVT, however, in some map zones, the Rocky Mountain Lower Montane-Foothill Shrubland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system were named *Artemisia tridentata* ssp. *vaseyana* Shrubland Alliance and *Quercus gambelii* Shrubland Alliance, respectively.

Table 3. Datasets for establishing and monitoring changes in sagebrush availability.

Dataset	Source	Update Interval	Most Recent Version Year	Use
BioPhysical Setting v1.1	LANDFIRE	Static	2008	Denominator for sagebrush availability
Existing Vegetation Type v1.2	LANDFIRE	Static	2010	Numerator for sagebrush availability
Cropland Data Layer	National Agricultural Statistics Service	Annual	2012	Agricultural updates; removes existing sagebrush from numerator of sagebrush availability
National Land Cover Dataset Percent Imperviousness	Multi-Resolution Land Characteristics Consortium (MRLC)	5-Year	2011 (next available in 2016)	Urban area updates; removes existing sagebrush from numerator of sagebrush availability
Fire Perimeters	GeoMac	Annual	2013	< 1,000-acre fire updates; removes existing sagebrush from numerator of sagebrush availability
Burn Severity	Monitoring Trends in Burn Severity	Annual	2012 (2-year delay in data availability)	> 1,000-acre fire updates; removes existing sagebrush from numerator of sagebrush availability except for unburned sagebrush islands

Table 4. Ecological systems in BpS and EVT capable of supporting sagebrush vegetation and capable of providing suitable seasonal habitat for Greater Sage-Grouse.

Ecological System	Sagebrush Vegetation that the Ecological System has the Capability of Producing
Colorado Plateau Mixed Low Sagebrush Shrubland	<i>Artemisia arbuscula</i> ssp. <i>longiloba</i> <i>Artemisia bigelovii</i> <i>Artemisia nova</i> <i>Artemisia frigida</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>
Columbia Plateau Low Sagebrush Steppe	<i>Artemisia arbuscula</i> <i>Artemisia arbuscula</i> ssp. <i>longiloba</i> <i>Artemisia nova</i>

Columbia Plateau Scabland Shrubland	<i>Artemisia rigida</i>
Columbia Plateau Steppe and Grassland	<i>Artemisia</i> spp.
Great Basin Xeric Mixed Sagebrush Shrubland	<i>Artemisia arbuscula</i> ssp. <i>longicaulis</i> <i>Artemisia arbuscula</i> ssp. <i>longiloba</i> <i>Artemisia nova</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>
Inter-Mountain Basins Big Sagebrush Shrubland	<i>Artemisia tridentata</i> ssp. <i>tridentata</i> <i>Artemisia tridentata</i> ssp. <i>xericensis</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>
Inter-Mountain Basins Big Sagebrush Steppe	<i>Artemisia cana</i> ssp. <i>cana</i> <i>Artemisia tridentata</i> ssp. <i>tridentata</i> <i>Artemisia tridentata</i> ssp. <i>xericensis</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia tripartita</i> ssp. <i>tripartita</i> <i>Artemisia frigida</i>
Inter-Mountain Basins Curl-Leaf Mountain Mahogany Woodland and Shrubland	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i> <i>Artemisia arbuscula</i> <i>Artemisia tridentata</i>
Inter-Mountain Basins Mixed Salt Desert Scrub	<i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia spinescens</i>
Inter-Mountain Basins Montane Sagebrush Steppe	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia nova</i> <i>Artemisia arbuscula</i> <i>Artemisia tridentata</i> ssp. <i>spiciformis</i>
Inter-Mountain Basins Semi-Desert Shrub-Steppe	<i>Artemisia tridentata</i> <i>Artemisia bigelovii</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>
Northwestern Great Plains Mixed Grass Prairie	<i>Artemisia cana</i> ssp. <i>cana</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> <i>Artemisia frigida</i>
Northwestern Great Plains Shrubland	<i>Artemisia cana</i> ssp. <i>cana</i> <i>Artemisia tridentata</i> ssp. <i>tridentata</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i>
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	<i>Artemisia tridentata</i>
Rocky Mountain Lower Montane-Foothill Shrubland	<i>Artemisia nova</i> <i>Artemisia tridentata</i> <i>Artemisia frigida</i>
Western Great Plains Floodplain Systems	<i>Artemisia cana</i> ssp. <i>cana</i>
Western Great Plains Sand Prairie	<i>Artemisia cana</i> ssp. <i>cana</i>
Wyoming Basins Dwarf Sagebrush Shrubland and Steppe	<i>Artemisia arbuscula</i> ssp. <i>longiloba</i> <i>Artemisia nova</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia tripartita</i> ssp. <i>rupicola</i>
<i>Artemisia tridentata</i> ssp. <i>vaseyana</i> Shrubland Alliance (EVT only)	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
<i>Quercus gambelii</i> Shrubland Alliance (EVT only)	<i>Artemisia tridentata</i>

Accuracy and Appropriate Use of LANDFIRE Datasets

Because of concerns over the thematic accuracy of individual classes mapped by LANDFIRE, all ecological systems listed in Table 4 will be merged into one value that represents the sagebrush base layer. With all ecological systems aggregated, the combined accuracy of the sagebrush base layer (EVT) will be much greater than if all categories were treated separately.

LANDFIRE performed the original accuracy assessment of its EVT product on a map zone basis. There are 20 LANDFIRE map zones that cover the historical range of sage-grouse as defined by Schroeder (2004). (See Attachment B, User and Producer Accuracies for Aggregated Ecological Systems within LANDFIRE Map Zones.) The aggregated sagebrush base layer for monitoring had user accuracies ranging from 57.1% to 85.7% and producer accuracies ranging from 56.7% to 100%.

LANDFIRE EVT data are not designed to be used at a local level. In reports of the percent sagebrush statistic for the various reporting units (Measure 1a), the uncertainty of the percent sagebrush will increase as the size of the reporting unit gets smaller. LANDFIRE data should never be used at the 30m pixel level (900m² resolution of raster data) for any reporting. The smallest geographic extent for using the data to determine percent sagebrush is at the PAC level; for the smallest PACs, the initial percent sagebrush estimate will have greater uncertainties compared with the much larger PACs.

Agricultural Adjustments for the Sagebrush Base Layer

The dataset for the geographic extent of agricultural lands will come from the National Agricultural Statistics Service (NASS) Cropland Data Layer (CDL) (<http://www.nass.usda.gov/research/Cropland/Release/index.htm>). CDL data are generated annually, with estimated producer accuracies for “large area row crops ranging from the mid 80% to mid-90%,” depending on the state (http://www.nass.usda.gov/research/Cropland/sarsfaqs2.htm#Section3_18.0). Specific information on accuracy may be found on the NASS metadata website (<http://www.nass.usda.gov/research/Cropland/metadata/meta.htm>). CDL provided the only dataset that matches the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in this monitoring framework and represents the best available agricultural lands mapping product.

The CDL data contain both agricultural classes and nonagricultural classes. For this effort, and in the baseline environmental report (Manier et al. 2013), nonagricultural classes were removed from the original dataset. The excluded classes are:

Barren (65 & 131), Deciduous Forest (141), Developed/High Intensity (124), Developed/Low Intensity (122), Developed/Med Intensity (123), Developed/Open Space (121), Evergreen Forest (142), Grassland Herbaceous (171), Herbaceous Wetlands (195), Mixed Forest (143), Open

Water (83 & 111), Other Hay/Non Alfalfa (37), Pasture/Hay (181), Pasture/Grass (62), Perennial Ice/Snow (112), Shrubland (64 & 152), Woody Wetlands (190).

The rule set for adjusting the sagebrush base layer for agricultural lands (and for updating the base layer for agricultural lands in the future) is that once an area is classified as agriculture in any year of the CDL, those pixels will remain out of the sagebrush base layer even if a new version of the CDL classifies that pixel as one of the nonagricultural classes listed above. The assumption is that even though individual pixels may be classified as a nonagricultural class in any given year, the pixel has not necessarily been restored to a natural sagebrush community that would be included in Table 4. A further assumption is that once an area has moved into agricultural use, it is unlikely that the area would be restored to sagebrush. Should that occur, however, the method and criteria for adding pixels back into the sagebrush base layer would follow those found in the sagebrush restoration monitoring section of this monitoring framework (see Section I.B.1.b., Monitoring Sagebrush Availability).

Urban Adjustments for the Sagebrush Base Layer

The National Land Cover Database (NLCD) (Fry et al. 2011) includes a percent imperviousness dataset that was selected as the best available dataset to be used for urban adjustments and monitoring. These data are generated on a 5-year cycle and are specifically designed to support monitoring efforts. Other datasets were evaluated and lacked the spatial specificity that was captured in the NLCD product. Any new impervious pixel in NLCD will be removed from the sagebrush base layer through the monitoring process. Although the impervious surface layer includes a number of impervious pixels outside of urban areas, this is acceptable for the adjustment and monitoring for two reasons. First, an evaluation of national urban area datasets did not reveal a layer that could be confidently used in conjunction with the NLCD product to screen impervious pixels outside of urban zones. This is because unincorporated urban areas were not being included, thus leaving large chunks of urban pixels unaccounted for in this rule set. Second, experimentation with setting a threshold on the percent imperviousness layer that would isolate rural features proved to be unsuccessful. No combination of values could be identified that would result in the consistent ability to limit impervious pixels outside urban areas. Therefore, to ensure consistency in the monitoring estimates, all impervious pixels will be used.

Fire Adjustments for the Sagebrush Base Layer

Two datasets were selected for performing fire adjustments and updates: GeoMac fire perimeters and Monitoring Trends in Burn Severity (MTBS). An existing data standard in the BLM requires that all fires of more than 10 acres are to be reported to GeoMac; therefore, there will be many small fires of less than 10 acres that will not be accounted for in the adjustment and monitoring attributable to fire. Using fire perimeters from GeoMac, all sagebrush pixels falling

within the perimeter of fires less than 1,000 acres will be used to adjust and monitor the sagebrush base layer.

For fires greater than 1,000 acres, MTBS was selected as a means to account for unburned sagebrush islands during the update process of the sagebrush base layer. The MTBS program (<http://www.mtbs.gov>) is an ongoing, multiyear project to map fire severity and fire perimeters consistently across the United States. One of the burn severity classes within MTBS is an unburned to low-severity class. This burn severity class will be used to represent unburned islands of sagebrush within the fire perimeter for the sagebrush base layer. Areas within the other severity classes within the fire perimeter will be removed from the base sagebrush layer during the update process. Not all wildfires, however, have the same impacts on the recovery of sagebrush habitat, depending largely on soil moisture and temperature regimes. For example, cooler, moister sagebrush habitat has a higher potential for recovery or, if needed, restoration than does the warmer, dryer sagebrush habitat. These cooler, moister areas will likely be detected as sagebrush in future updates to LANDFIRE.

Conifer Encroachment Adjustment for the Sagebrush Base Layer

Conifer encroachment into sagebrush vegetation reduces the spatial extent of sage-grouse habitat (Davies et al. 2011, Baruch-Mordo et al. 2013). Conifer species that show propensity for encroaching into sagebrush vegetation resulting in sage-grouse habitat loss include various juniper species, such as Utah juniper (*Juniperus osteosperma*), western juniper (*Juniperus occidentalis*), Rocky Mountain juniper (*Juniperus scopulorum*), pinyon species, including singleleaf pinyon (*Pinus monophylla*) and pinyon pine (*Pinus edulis*), ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), and Douglas fir (*Pseudotsuga menziesii*) (Gruell et al. 1986, Grove et al. 2005, Davies et al. 2011).

A rule set for conifer encroachment was developed to adjust the sagebrush base layer. To capture the geographic extent of sagebrush that is likely to experience conifer encroachment, ecological systems within LANDFIRE EVT version 1.2 (NatureServe 2011) were identified if they had the capability of supporting both the conifer species (listed above) and sagebrush vegetation. Those ecological systems were deemed to be the plant communities with conifers most likely to encroach into sagebrush vegetation. (See Table 5, Ecological systems with conifers most likely to encroach into sagebrush vegetation.) Sagebrush vegetation was defined as including sagebrush species or subspecies that provide habitat for the Greater Sage-Grouse and that are included in the HAF. (See Attachment C, Sagebrush Species and Subspecies Included in the Selection Criteria for Building the EVT and BpS Layers.) An adjacency analysis was conducted to identify all sagebrush pixels that were directly adjacent to these conifer ecological systems, and these pixels were removed from the sagebrush base layer.

Table 5. Ecological systems with conifers most likely to encroach into sagebrush vegetation.

EVT Ecological Systems	Coniferous Species and Sagebrush Vegetation that the Ecological System has the Capability of Producing
Colorado Plateau Pinyon-Juniper Woodland	<i>Pinus edulis</i> <i>Juniperus osteosperma</i> <i>Artemisia tridentata</i> <i>Artemisia arbuscula</i> <i>Artemisia nova</i> <i>Artemisia tridentata</i> ssp. <i>tridentata</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> <i>Artemisia bigelovii</i> <i>Artemisia pygmaea</i>
Columbia Plateau Western Juniper Woodland and Savanna	<i>Juniperus occidentalis</i> <i>Pinus ponderosa</i> <i>Artemisia tridentata</i> <i>Artemisia arbuscula</i> <i>Artemisia rigida</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
East Cascades Oak-Ponderosa Pine Forest and Woodland	<i>Pinus ponderosa</i> <i>Pseudotsuga menziesii</i> <i>Artemisia tridentata</i> <i>Artemisia nova</i>
Great Basin Pinyon-Juniper Woodland	<i>Pinus monophylla</i> <i>Juniperus osteosperma</i> <i>Artemisia arbuscula</i> <i>Artemisia nova</i> <i>Artemisia tridentata</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	<i>Pinus ponderosa</i> <i>Artemisia tridentata</i> <i>Artemisia arbuscula</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
Rocky Mountain Foothill Limber Pine-Juniper Woodland	<i>Juniperus osteosperma</i> <i>Juniperus scopulorum</i> <i>Artemisia nova</i> <i>Artemisia tridentata</i>
Rocky Mountain Poor-Site Lodgepole Pine Forest	<i>Pinus contorta</i> <i>Pseudotsuga menziesii</i> <i>Pinus ponderosa</i> <i>Artemisia tridentata</i>
Southern Rocky Mountain Pinyon-Juniper Woodland	<i>Pinus edulis</i> <i>Juniperus monosperma</i> <i>Artemisia bigelovii</i> <i>Artemisia tridentata</i> <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
Southern Rocky Mountain Ponderosa Pine Woodland	<i>Pinus ponderosa</i> <i>Pseudotsuga menziesii</i>

	<i>Pinus edulis</i> <i>Pinus contorta</i> <i>Juniperus</i> spp. <i>Artemisia nova</i> <i>Artemisia tridentata</i> <i>Artemisia arbuscula</i> <i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
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Invasive Annual Grasses Adjustments for the Sagebrush Base Layer

There are no invasive species datasets from 2010 to the present (beyond the LANDFIRE data) that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated) for use in the determination of the sagebrush base layer. For a description of how invasive species land cover will be incorporated in the sagebrush base layer in the future, see Section I.B.1.b., Monitoring Sagebrush Availability.

Sagebrush Restoration Adjustments for the Sagebrush Base Layer

There are no datasets from 2010 to the present that could provide additions to the sagebrush base layer from restoration treatments that meet the three criteria (nationally consistent, known level of accuracy, and periodically updated); therefore, no adjustments were made to the sagebrush base layer calculated from the LANDFIRE EVT (version 1.2) attributable to restoration activities since 2010. Successful restoration treatments before 2010 are assumed to have been captured in the LANDFIRE refresh.

b. Monitoring Sagebrush Availability

Monitoring Sagebrush Availability

Sagebrush availability will be updated annually by incorporating changes to the sagebrush base layer attributable to agriculture, urbanization, and wildfire. The monitoring schedule for the existing sagebrush base layer updates is as follows:

2010 Existing Sagebrush Base Layer = [Sagebrush EVT] minus [2006 Imperviousness Layer] minus [2009 and 2010 CDL] minus [2009/10 GeoMac Fires that are less than 1,000 acres] minus [2009/10 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter] minus [Conifer Encroachment Layer]

2012 Existing Sagebrush Update = [2010 Existing Sagebrush Base Layer] minus [2011 Imperviousness Layer] minus [2011 and 2012 CDL] minus [2011/12 GeoMac Fires < 1,000 acres] minus [2011/12 MTBS Fires that are greater than 1,000 acres, excluding unburned sagebrush islands within the perimeter]

Monitoring Existing Sagebrush post 2012 = [Previous Existing Sagebrush Update Layer] minus [Imperviousness Layer (if new data are available)] minus [Next 2 years of CDL] minus [Next 2 years of GeoMac Fires < 1,000 acres] minus [Next 2 years of MTBS Fires that are greater than

1,000 acres, excluding unburned sagebrush islands within the perimeter] plus
[restoration/monitoring data provided by the field]

Monitoring Sagebrush Restoration

Restoration after fire, after agricultural conversion, after seedings of introduced grasses, or after treatments of pinyon pine and/or juniper are examples of updates to the sagebrush base layer that can add sagebrush vegetation back into sagebrush availability in the landscape. When restoration has been determined to be successful through rangewide, consistent, interagency fine- and site-scale monitoring, the polygonal data will be used to add sagebrush pixels back into the broad- and mid-scale sagebrush base layer.

Measure 1b: Context for Monitoring the Amount of Sagebrush in a Geographic Area of Interest

Measure 1b describes the amount of sagebrush on the landscape of interest compared with the amount of sagebrush the landscape of interest could ecologically support. Areas with the potential to support sagebrush were derived from the BpS data layer that describes sagebrush pre-EuroAmerican settlement (v1.2 of LANDFIRE).

The identification and spatial locations of natural plant communities (vegetation) that are believed to have existed on the landscape (BpS) were constructed based on an approximation of the historical (pre-EuroAmerican settlement) disturbance regime and how the historical disturbance regime operated on the current biophysical environment. BpS is composed of map units that are based on NatureServe (2011) terrestrial ecological systems classification.

The ecological systems within BpS used for this monitoring framework are those ecological systems that are capable of supporting sagebrush vegetation and of providing seasonal habitat for sage-grouse (Table 4). Ecological systems selected included sagebrush species or subspecies that are included in the HAF and listed in Attachment C.

The BpS layer does not have an associated accuracy assessment, given the lack of any reference data. Visual inspection of the BpS data, however, reveals inconsistencies in the labeling of pixels among LANDFIRE map zones. The reason for these inconsistencies is that the rule sets used to map a given ecological system will vary among map zones based on different physical, biological, disturbance, and atmospheric regimes of the region. These variances can result in artificial edges in the map. Metrics will be calculated, however, at broad spatial scales using BpS potential vegetation type, not small groupings or individual pixels. Therefore, the magnitude of these observable errors in the BpS layer will be minor compared with the size of the reporting units. Since BpS will be used to identify broad landscape patterns of dominant vegetation, these inconsistencies will have only a minor impact on the percent sagebrush availability calculation. *As with the LANDFIRE EVT, LANDFIRE BpS data are not designed to be used at a local level. LANDFIRE data should never be used at the 30m pixel level for reporting.*

In conclusion, sagebrush availability data will be used to inform effectiveness monitoring and initiate adaptive management actions as necessary. The 2010 estimate of sagebrush availability will serve as the base year, and an updated estimate for 2012 will be reported in 2014 after all datasets become available. The 2012 estimate will capture changes attributable to wildfire, agriculture, and urban development. Subsequent updates will always include new fire and agricultural data and new urban data when available. Restoration data that meet the criteria for adding sagebrush areas back into the sagebrush base layer will be factored in as data allow. Given data availability, there will be a 2-year lag (approximately) between when the estimate is generated and when the data used for the estimate become available (e.g., the 2014 sagebrush availability will be included in the 2016 estimate).

Future Plans

Geospatial data used to generate the sagebrush base layer will be available through the BLM's EGIS web portal and geospatial gateway or through the authoritative data source. Legacy datasets will be preserved so that trends may be calculated. Additionally, accuracy assessment data for all source datasets will be provided on the portal either spatially, where applicable, or through the metadata. Accuracy assessment information was deemed vital to help users understand the limitation of the sagebrush estimates; it will be summarized spatially by map zone and will be included in the portal.

LANDFIRE plans to begin a remapping effort in 2015. This remapping has the potential to improve the overall quality of data products greatly, primarily through the use of higher-quality remote sensing datasets. Additionally, the BLM and the Multi-Resolution Land Characteristics Consortium (MRLC) are working to improve the accuracy of vegetation map products for broad- and mid-scale analyses through the Grass/Shrub mapping effort. The Grass/Shrub mapping effort applies the Wyoming multiscale sagebrush habitat methodology (Homer et al. 2009) to depict spatially the fractional percent cover estimates for five components rangewide and West-wide. These five components are percent cover of sagebrush vegetation, percent bare ground, percent herbaceous vegetation (grass and forbs combined), annual vegetation, and percent shrubs. A benefit of the design of these fractional cover maps is that they facilitate monitoring "within" class variation (e.g., examination of declining trend in sagebrush cover for individual pixels). This "within" class variation can serve as one indicator of sagebrush quality that cannot be derived from LANDFIRE's EVT information. The Grass/Shrub mapping effort is not a substitute for fine-scale monitoring but will leverage fine-scale data to support the validation of the mapping products. An evaluation will be conducted to determine if either dataset is of great enough quality to warrant replacing the existing sagebrush layers. At the earliest, this evaluation will occur in 2018 or 2019, depending on data availability.

B.2. Habitat Degradation Monitoring (Measure 2)

The measure of habitat degradation will be calculated by combining the footprints of threats identified in Table 2. The footprint is defined as the direct area of influence of “active” energy and infrastructure; it is used as a surrogate for human activity. Although these analyses will try to summarize results at the aforementioned meaningful geographic areas of interest, some may be too small to report the metrics appropriately and may be combined (smaller populations, PACs within a population, etc.). Data sources for each threat are found in Table 6, Geospatial data sources for habitat degradation. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure, are detailed below. All datasets will be updated annually to monitor broad- and mid-scale year-to-year changes and to calculate trends in habitat degradation to inform adaptive management. A 5-year summary report will be provided to the USFWS.

a. Habitat Degradation Datasets and Assumptions

Energy (oil and gas wells and development facilities)

This dataset will compile information from three oil and gas databases: the proprietary IHS Enerdeq database, the BLM Automated Fluid Minerals Support System (AFMSS) database, and the proprietary Platts (a McGraw-Hill Financial Company) GIS Custom Data (hereafter, Platts) database of power plants. Point data from wells active within the last 10 years from IHS and producing wells from AFMSS will be considered as a 5-acre (2.0ha) direct area of influence centered on the well point, as recommended by the BLM WO-300 (Minerals and Realty Management). Plugged and abandoned wells will be removed if the date of well abandonment was before the first day of the reporting year (i.e., for the 2015 reporting year, a well must have been plugged and abandoned by 12/31/2014 to be removed). Platts oil and gas power plants data (subset to operational power plants) will also be included as a 5-acre (2.0ha) direct area of influence.

Additional Measure: Reclaimed Energy-related Degradation. This dataset will include those wells that have been plugged and abandoned. This measure thereby attempts to measure energy-related degradation that has been reclaimed but not necessarily fully restored to sage-grouse habitat. This measure will establish a baseline by using wells that have been plugged and abandoned within the last 10 years from the IHS and AFMSS datasets. Time lags for lek attendance in response to infrastructure have been documented to be delayed 2–10 years from energy development activities (Harju et al. 2010). Reclamation actions may require 2 or more years from the Final Abandonment Notice. Sagebrush seedling establishment may take 6 or more years from the point of seeding, depending on such variables as annual precipitation, annual temperature, and soil type and depth (Pyke 2011). This 10-year period is conservative and assumes some level of habitat improvement 10 years after plugging. Research by Hemstrom et al. (2002), however,

proposes an even longer period—more than 100 years—for recovery of sagebrush habitats, even with active restoration approaches. Direct area of influence will be considered 3 acres (1.2ha) (J. Perry, personal communication, February 12, 2014). This additional layer/measure could be used at the broad and mid scale to identify areas where sagebrush habitat and/or potential sagebrush habitat is likely still degraded. This layer/measure could also be used where further investigation at the fine or site scale would be warranted to: 1) quantify the level of reclamation already conducted, and 2) evaluate the amount of restoration still required for sagebrush habitat recovery. At a particular level (e.g., population, PACs), these areas and the reclamation efforts/success could be used to inform reclamation standards associated with future developments. Once these areas have transitioned from reclamation standards to meeting *restoration* standards, they can be added back into the sagebrush availability layer using the same methodology as described for adding restoration treatment areas lost to wildfire and agriculture conversion (see Monitoring Sagebrush Restoration in Section I.B.1.b., Monitoring Sagebrush Availability). This dataset will be updated annually from the IHS dataset.

Energy (coal mines)

Currently, there is no comprehensive dataset available that identifies the footprint of active coal mining across all jurisdictions. Therefore, point and polygon datasets will be used each year to identify coal mining locations. Data sources will be identified and evaluated annually and will include at a minimum: BLM coal lease polygons, U.S. Energy Information Administration mine occurrence points, U.S. Office of Surface Mining Reclamation and Enforcement coal mining permit polygons (as available), and U.S. Geological Survey (USGS) Mineral Resources Data System mine occurrence points. These data will inform where active coal mining may be occurring. Additionally, coal power plant data from Platts power plants database (subset to operational power plants) will be included. Aerial imagery will then be used to digitize manually the active coal mining and coal power plants surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from Esri and/or Google will be used to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active coal mine and power plant direct area of influence. Coal mine location data source and imagery date will be documented for each digitized coal polygon at the time of creation. Subsurface facility locations (polygon or point location as available) will also be collected if available, included in density calculations, and added to the active surface activity layer as appropriate (if an actual direct area of influence can be located).

Energy (wind energy facilities)

This dataset will be a subset of the Federal Aviation Administration (FAA) Digital Obstacles point file. Points where “Type_” = “WINDMILL” will be included. Direct area of influence of these point features will be measured by converting to a polygon dataset as a direct area of

influence of 3 acres (1.2ha) centered on each tower point. See the BLM's "Wind Energy Development Programmatic Environmental Impact Statement" (BLM 2005). Additionally, Platts power plants database will be used for transformer stations associated with wind energy sites (subset to operational power plants), also with a 3-acre (1.2ha) direct area of influence.

Energy (solar energy facilities)

This dataset will include solar plants as compiled with the Platts power plants database (subset to operational power plants). This database includes an attribute that indicates the operational capacity of each solar power plant. Total capacity at the power plant was based on ratings of the in-service unit(s), in megawatts. Direct area of influence polygons will be centered over each point feature representing 7.3ac (3.0ha) per megawatt of the stated operational capacity, per the report of the National Renewable Energy Laboratory (NREL), "Land-Use Requirements for Solar Power Plants in the United States" (Ong et al. 2013).

Energy (geothermal energy facilities)

This dataset will include geothermal wells in existence or under construction as compiled with the IHS wells database and power plants as compiled with the Platts database (subset to operational power plants). Direct area of influence of these point features will be measured by converting to a polygon dataset of 3 acres (1.2ha) centered on each well or power plant point.

Mining (active developments; locatable, leasable, saleable)

This dataset will include active locatable mining locations as compiled with the proprietary InfoMine database. Aerial imagery will then be used to digitize manually the active mining surface disturbance in or near these known occurrence areas. While the date of aerial imagery varies by scale, the most current data available from Esri and/or Google will be used to locate (generally at 1:50,000 and below) and digitize (generally at 1:10,000 and below) active mine direct area of influence. Mine location data source and imagery date will be documented for each digitized polygon at the time of creation. Currently, there are no known compressive databases available for leasable or saleable mining sites beyond coal mines. Other data sources will be evaluated and used as they are identified or as they become available. Point data may be converted to polygons to represent direct area of influence unless actual surface disturbance is available.

Infrastructure (roads)

This dataset will be compiled from the proprietary Esri StreetMap Premium for ArcGIS. Dataset features that will be used are: Interstate Highways, Major Roads, and Surface Streets to capture most paved and "crowned and ditched" roads while not including "two-track" and 4-wheel-drive routes. These minor roads, while not included in the broad- and mid-scale monitoring, may support a volume of traffic that can have deleterious effects on sage-grouse leks. It may be

appropriate to consider the frequency and type of use of roads in a NEPA analysis for a proposed project. This fine- and site-scale analysis will require more site-specific data than is identified in this monitoring framework. The direct area of influence for roads will be represented by 240.2ft, 84.0ft, and 40.7ft (73.2m, 25.6m, and 12.4m) total widths centered on the line feature for Interstate Highways, Major Roads, and Surface Streets, respectively (Knick et al. 2011). The most current dataset will be used for each monitoring update. *Note: This is a related but different dataset than what was used in BER (Manier et al. 2013). Individual BLM/USFS planning units may use different road layers for fine- and site-scale monitoring.*

Infrastructure (railroads)

This dataset will be a compilation from the Federal Railroad Administration Rail Lines of the USA dataset. Non-abandoned rail lines will be used; abandoned rail lines will not be used. The direct area of influence for railroads will be represented by a 30.8ft (9.4m) total width (Knick et al. 2011) centered on the non-abandoned railroad line feature.

Infrastructure (power lines)

This line dataset will be derived from the proprietary Platts transmission lines database. Linear features in the dataset attributed as “buried” will be removed from the disturbance calculation. Only “In Service” lines will be used; “Proposed” lines will not be used. Direct area of influence will be determined by the kV designation: 1–199 kV (100ft/30.5m), 200–399 kV (150ft/45.7m), 400–699 kV (200ft/61.0m), and 700-or greater kV (250ft/76.2m) based on average right-of-way and structure widths, according to BLM WO-300 (Minerals and Realty Management).

Infrastructure (communication towers)

This point dataset will be compiled from the Federal Communications Commission (FCC) communication towers point file; all duplicate points will be removed. It will be converted to a polygon dataset by using a direct area of influence of 2.5 acres (1.0ha) centered on each communication tower point (Knick et al. 2011).

Infrastructure (other vertical structures)

This point dataset will be compiled from the FAA’s Digital Obstacles point file. Points where “Type_” = “WINDMILL” will be removed. Duplicate points from the FCC communication towers point file will be removed. Remaining features will be converted to a polygon dataset using a direct area of influence of 2.5 acres (1.0ha) centered on each vertical structure point (Knick et al. 2011).

Other Developed Rights-of-Way

Currently, no additional data sources for other rights-of-way have been identified; roads, power lines, railroads, pipelines, and other known linear features are represented in the categories

described above. The newly purchased IHS data do contain pipeline information; however, this database does not currently distinguish between above-ground and underground pipelines. If additional features representing human activities are identified, they will be added to monitoring reports using similar assumptions to those used with the threats described above.

b. Habitat Degradation Threat Combination and Calculation

The threats targeted for measuring human activity (Table 2) will be converted to direct area of influence polygons as described for each threat above. These threat polygon layers will be combined and features dissolved to create one overall polygon layer representing footprints of active human activity in the range of sage-grouse. Individual datasets, however, will be preserved to indicate which types of threats may be contributing to overall habitat degradation.

This measure has been divided into three submeasures to describe habitat degradation on the landscape. Percentages will be calculated as follows:

Measure 2a. Footprint by geographic area of interest: Divide area of the active/direct footprint by the total area of the geographic area of interest (% disturbance in geographic area of interest).

Measure 2b. Active/direct footprint by historical sagebrush potential: Divide area of the active footprint that coincides with areas with historical sagebrush potential (BpS calculation from habitat availability) within a given geographic area of interest by the total area with sagebrush potential within the geographic area of interest (% disturbance on potential historical sagebrush in geographic area of interest).

Measure 2c. Active/direct footprint by current sagebrush: Divide area of the active footprint that coincides with areas of existing sagebrush (EVT calculation from habitat availability) within a given geographic area of interest by the total area that is current sagebrush within the geographic area of interest (% disturbance on current sagebrush in geographic area of interest).

B.3. Energy and Mining Density (Measure 3)

The measure of density of energy and mining will be calculated by combining the locations of energy and mining threats identified in Table 2. This measure will provide an estimate of the intensity of human activity or the intensity of habitat degradation. The number of energy facilities and mining locations will be summed and divided by the area of meaningful geographic areas of interest to calculate density of these activities. Data sources for each threat are found in Table 6. Specific assumptions (inclusion criteria for data, width/area assumptions for point and line features, etc.) and methodology for each threat, and the combined measure, are detailed

below. All datasets will be updated annually to monitor broad- and mid-scale year-to-year changes and 5-year (or longer) trends in habitat degradation.

Table 6. Geospatial data sources for habitat degradation (Measure 2).

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

a. Energy and Mining Density Datasets and Assumptions

Energy (oil and gas wells and development facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (coal mines)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (wind energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (solar energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Energy (geothermal energy facilities)

(See Section I.B.2., Habitat Degradation Monitoring.)

Mining (active developments; locatable, leasable, saleable)

(See Section I.B.2., Habitat Degradation Monitoring.)

b. Energy and Mining Density Threat Combination and Calculation

Datasets for energy and mining will be collected in two primary forms: point locations (e.g., wells) and polygon areas (e.g., surface coal mining). The following rule set will be used to calculate density for meaningful geographic areas of interest including standard grids and per polygon:

- 1) Point locations will be preserved; no additional points will be removed beyond the methodology described above. Energy facilities in close proximity (an oil well close to a wind tower) will be retained.
- 2) Polygons will not be merged, or features further dissolved. Thus, overlapping facilities will be retained, such that each individual threat will be a separate polygon data input for the density calculation.
- 3) The analysis unit (polygon or 640-acre section in a grid) will be the basis for counting the number of mining or energy facilities per unit area. Within the analysis unit, all point features will be summed, and any individual polygons will be counted as one (e.g., a coal mine will be counted as one facility within population). Where polygon features overlap multiple units (polygons or pixels), the facility will be counted as one in each unit where the polygon occurs (e.g., a polygon crossing multiple 640-acre

sections would be counted as one in each 640-acre section for a density per 640-acre-section calculation).

- 4) In methodologies with different-sized units (e.g., MZs, populations, etc.) raw facility counts will be converted to densities by dividing the raw facility counts by the total area of the unit. Typically this will be measured as facilities per 640 acres.
- 5) For uniform grids, raw facility counts will be reported. Typically this number will also be converted to facilities per 640 acres.
- 6) Reporting may include summaries beyond the simple ones above. Zonal statistics may be used to smooth smaller grids to help display and convey information about areas within meaningful geographic areas of interest that have high levels of energy and/or mining activity.
- 7) Additional statistics for each defined unit may also include adjusting the area to include only the area with the historical potential for sagebrush (BpS) or areas currently sagebrush (EVT).

Individual datasets and threat combination datasets for habitat degradation will be available through the BLM's EGIS web portal and geospatial gateway. Legacy datasets will be preserved so that trends may be calculated.

C. Population (Demographics) Monitoring

State wildlife management agencies are responsible for monitoring sage-grouse populations within their respective states. WAFWA will coordinate this collection of annual population data by state agencies. These data will be made available to the BLM according to the terms of the forthcoming Greater Sage-Grouse Population Monitoring Memorandum of Understanding (MOU) (2014) between WAFWA and the BLM. The MOU outlines a process, timeline, and responsibilities for regular data sharing of sage-grouse population and/or habitat information for the purposes of implementing sage-grouse LUPs/amendments and subsequent effectiveness monitoring. Population areas were refined from the "Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives: Final Report" (COT 2013) by individual state wildlife agencies to create a consistent naming nomenclature for future data analyses. These population data will be used for analysis at the applicable scale to supplement habitat effectiveness monitoring of management actions and to inform the adaptive management responses.

D. Effectiveness Monitoring

Effectiveness monitoring will provide the data needed to evaluate BLM and USFS actions toward reaching the objective of the national planning strategy (BLM IM 2012-044)—to conserve sage-grouse populations and their habitat—and the objectives for the land use planning

area. Effectiveness monitoring methods described here will encompass multiple larger scales, from areas as large as the WAFWA MZ to the scale of this LUP. Effectiveness data used for these larger-scale evaluations will include all lands in the area of interest, regardless of surface ownership/management, and will help inform where finer-scale evaluations are needed, such as population areas smaller than an LUP or PACs within an LUP (described in Section II, Fine and Site Scales). Data will also include the trend of disturbance within these areas of interest to inform the need to initiate adaptive management responses as described in the land use plan.

Effectiveness monitoring reported for these larger areas provides the context to conduct effectiveness monitoring at finer scales. This approach also helps focus scarce resources to areas experiencing habitat loss, degradation, or population declines, without excluding the possibility of concurrent, finer-scale evaluations as needed where habitat or population anomalies have been identified through some other means.

To determine the effectiveness of the sage-grouse national planning strategy, the BLM and the USFS will evaluate the answers to the following questions and prepare a broad- and mid-scale effectiveness report:

- 1) Sagebrush Availability and Condition:
 - a. What is the amount of sagebrush availability and the change in the amount and condition of sagebrush?
 - b. What is the existing amount of sagebrush on the landscape and the change in the amount relative to the pre-EuroAmerican historical distribution of sagebrush (BpS)?
 - c. What is the trend and condition of the indicators describing sagebrush characteristics important to sage-grouse?
- 2) Habitat Degradation and Intensity of Activities:
 - a. What is the amount of habitat degradation and the change in that amount?
 - b. What is the intensity of activities and the change in the intensity?
 - c. What is the amount of reclaimed energy-related degradation and the change in the amount?
- 3) What is the population estimation of sage-grouse and the change in the population estimation?
- 4) How are the BLM and the USFS contributing to changes in the amount of sagebrush?
- 5) How are the BLM and the USFS contributing to disturbance?

The compilation of broad- and mid-scale data (and population trends as available) into an effectiveness monitoring report will occur on a 5-year reporting schedule (see Attachment A), which may be accelerated to respond to critical emerging issues (in consultation with the USFWS and state wildlife agencies). In addition, effectiveness monitoring results will be used to identify emerging issues and research needs and inform the BLM and the USFS adaptive

management strategy (see the adaptive management section of this Environmental Impact Statement).

To determine the effectiveness of the sage-grouse objectives of the land use plan, the BLM and the USFS will evaluate the answers to the following questions and prepare a plan effectiveness report:

- 1) Is this plan meeting the sage-grouse habitat objectives?
- 2) Are sage-grouse areas within the LUP meeting, or making progress toward meeting, land health standards, including the Special Status Species/wildlife habitat standard?
- 3) Is the plan meeting the disturbance objective(s) within sage-grouse areas?
- 4) Are the sage-grouse populations within this plan boundary and within the sage-grouse areas increasing, stable, or declining?

The effectiveness monitoring report for this LUP will occur on a 5-year reporting schedule (see Attachment A) or more often if habitat or population anomalies indicate the need for an evaluation to facilitate adaptive management or respond to critical emerging issues. Data will be made available through the BLM's EGIS web portal and the geospatial gateway.

Methods

At the broad and mid scales (PACs and above) the BLM and the USFS will summarize the vegetation, disturbance, and (when available) population data. Although the analysis will try to summarize results for PACs within each sage-grouse population, some populations may be too small to report the metrics appropriately and may need to be combined to provide an estimate with an acceptable level of accuracy. Otherwise, they will be flagged for more intensive monitoring by the appropriate landowner or agency. The BLM and the USFS will then analyze monitoring data to detect the trend in the amount of sagebrush; the condition of the vegetation in the sage-grouse areas (MacKinnon et al. 2011); the trend in the amount of disturbance; the change in disturbed areas owing to successful restoration; and the amount of new disturbance the BLM and/or the USFS has permitted. These data could be supplemented with population data (when available) to inform an understanding of the correlation between habitat and PACs within a population. This overall effectiveness evaluation must consider the lag effect response of populations to habitat changes (Garton et al. 2011).

Calculating Question 1, National Planning Strategy Effectiveness: The amount of sagebrush available in the large area of interest will use the information from Measure 1a (I.B.1., Sagebrush Availability) and calculate the change from the 2012 baseline to the end date of the reporting period. To calculate the change in the amount of sagebrush on the landscape to compare with the historical areas with potential to support sagebrush, the information from Measure 1b (I.B.1., Sagebrush Availability) will be used. To calculate the trend in the condition of sagebrush at the mid scale, three sources of data will be used: the BLM's Grass/Shrub mapping effort (Future Plans in Section I.B.1., Sagebrush Availability); the results from the calculation of the landscape

indicators, such as patch size (described below); and the BLM's Landscape Monitoring Framework (LMF) and sage-grouse intensification effort (also described below). The LMF and sage-grouse intensification effort data are collected in a statistical sampling framework that allows calculation of indicator values at multiple scales.

Beyond the importance of sagebrush availability to sage-grouse, the mix of sagebrush patches on the landscape at the broad and mid scale provides the life requisite of space for sage-grouse dispersal needs (see the HAF). The configuration of sagebrush habitat patches and the land cover or land use between the habitat patches at the broad and mid scales also defines suitability. There are three significant habitat indicators that influence habitat use, dispersal, and movement across populations: the size and number of habitat patches, the connectivity of habitat patches (linkage areas), and habitat fragmentation (scope of unsuitable and non-habitats between habitat patches). The most appropriate commercial software to measure patch dynamics, connectivity, and fragmentation at the broad and mid scales will be used, along with the same data layers derived for sagebrush availability.

The BLM initiated the LMF in 2011 in cooperation with the Natural Resources Conservation Service (NRCS). The objective of the LMF effort is to provide unbiased estimates of vegetation and soil condition and trend using a statistically balanced sample design across BLM lands. Recognizing that sage-grouse populations are more resilient where the sagebrush plant community has certain characteristics unique to a particular life stage of sage-grouse (Knick and Connelly 2011, Stiver et al. *in press*), a group of sage-grouse habitat and sagebrush plant community subject matter experts identified those vegetation indicators collected at LMF sampling points that inform sage-grouse habitat needs. The experts represented the Agricultural Research Service, BLM, NRCS, USFWS, WAFWA, state wildlife agencies, and academia. The common indicators identified include: species composition, foliar cover, height of the tallest sagebrush and herbaceous plant, intercanopy gap, percent of invasive species, sagebrush shape, and bare ground. To increase the precision of estimates of sagebrush conditions within the range of sage-grouse, additional plot locations in occupied sage-grouse habitat (Sage-Grouse Intensification) were added in 2013. The common indicators are also collected on sampling locations in the NRCS National Resources Inventory Rangeland Resource Assessment (<http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/nri/?&cid=stelprdb1041620>).

The sage-grouse intensification baseline data will be collected over a 5-year period, and an annual sage-grouse intensification report will be prepared describing the status of the indicators. Beginning in year 6, the annual status report will be accompanied with a trend report, which will be available on an annual basis thereafter, contingent on continuation of the current monitoring budget. This information, in combination with the Grass/Shrub mapping information, the mid-scale habitat suitability indicator measures, and the sagebrush availability information will be used to answer Question 1 of the National Planning Strategy Effectiveness Report.

Calculating Question 2, National Planning Strategy Effectiveness: Evaluations of the amount of habitat degradation and the intensity of the activities in the area of interest will use the information from Measure 2 (Section I.B.2., Habitat Degradation Monitoring) and Measure 3 (Section I.B.3., Energy and Mining Density). The field office will collect data on the amount of reclaimed energy-related degradation on plugged and abandoned and oil/gas well sites. The data are expected to demonstrate that the reclaimed sites have yet to meet the habitat restoration objectives for sage-grouse habitat. This information, in combination with the amount of habitat degradation, will be used to answer Question 2 of the National Planning Strategy Effectiveness Report.

Calculating Question 3, National Planning Strategy Effectiveness: The change in sage-grouse estimated populations will be calculated from data provided by the state wildlife agencies, when available. This population data (Section I.C., Population [Demographics] Monitoring) will be used to answer Question 3 of the National Planning Strategy Effectiveness Report.

Calculating Question 4, National Planning Strategy Effectiveness: The estimated contribution by the BLM or the USFS to the change in the amount of sagebrush in the area of interest will use the information from Measure 1a (Section I.B.1., Sagebrush Availability). This measure is derived from the national datasets that remove sagebrush (Table 3). To determine the relative contribution of BLM and USFS management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for this measure in the geographic areas of interest. This information will be used to answer Question 4 of the National Planning Strategy Effectiveness Report.

Calculating Question 5, National Planning Strategy Effectiveness: The estimated contribution by the BLM or the USFS to the change in the amount of disturbance in the area of interest will use the information from Measure 2a (Section I.B.2., Monitoring Habitat Degradation) and Measure 3 (Section I.B.3., Energy and Mining Density). These measures are all derived from the national disturbance datasets that degrade habitat (Table 6). To determine the relative contribution of BLM and USFS management, the current Surface Management Agency geospatial data layer will be used to differentiate the amount of change for each management agency for these two measures in the geographic areas of interest. This information will be used to answer Question 5 of the National Planning Strategy Effectiveness Report.

Answers to the five questions for determining the effectiveness of the national planning strategy will identify areas that appear to be meeting the objectives of the strategy and will facilitate identification of population areas for more detailed analysis. Conceptually, if the broad-scale monitoring identifies increasing sagebrush availability and improving vegetation conditions, decreasing disturbance, and a stable or increasing population for the area of interest, there is evidence that the objectives of the national planning strategy to maintain populations and their habitats have been met. Conversely, where information indicates that sagebrush is decreasing and vegetation conditions are degrading, disturbance in sage-grouse areas is increasing, and/or

populations are declining relative to the baseline, there is evidence that the objectives of the national planning strategy are not being achieved. Such a determination would likely result in a more detailed analysis and could be the basis for implementing more restrictive adaptive management measures.

With respect to the land use plan area, the BLM and the USFS will summarize the vegetation, disturbance, and population data to determine if the LUP is meeting the plan objectives. Effectiveness information used for these evaluations includes BLM/USFS surface management areas and will help inform where finer-scale evaluations are needed, such as seasonal habitats, corridors, or linkage areas. Data will also include the trend of disturbance within the sage-grouse areas, which will inform the need to initiate adaptive management responses as described in the land use plan.

Calculating Question 1, Land Use Plan Effectiveness: The condition of vegetation and the allotments meeting land health standards (as articulated in “BLM Handbook 4180-1, Rangeland Health Standards”) in sage-grouse areas will be used to determine the LUP’s effectiveness in meeting the vegetation objectives for sage-grouse habitat set forth in the plan. The field office/ranger district will be responsible for collecting this data. In order for this data to be consistent and comparable, common indicators, consistent methods, and an unbiased sampling framework will be implemented following the principles in the BLM’s AIM strategy (Taylor et al. 2014; Toeys et al. 2011; MacKinnon et al. 2011), in the BLM’s Technical Reference “Interpreting Indicators of Rangeland Health” (Pellant et al. 2005), and in the HAF (Stiver et al. *in press*) or other approved WAFWA MZ-consistent guidance to measure and monitor sage-grouse habitats. This information will be used to answer Question 1 of the Land Use Plan Effectiveness Report.

Calculating Question 2, Land Use Plan Effectiveness: Sage-grouse areas within the LUP that are achieving land health stands (or, if trend data are available, that are making progress toward achieving them)—particularly the Special Status Species/wildlife habitat land health standard—will be used to determine the LUP’s effectiveness in achieving the habitat objectives set forth in the plan. Field offices will follow directions in “BLM Handbook 4180-1, Rangeland Health Standards,” to ascertain if sage-grouse areas are achieving or making progress toward achieving land health standards. One of the recommended criteria for evaluating this land health standard is the HAF indicators.

Calculating Question 3, Land Use Plan Effectiveness: The amount of habitat disturbance in sage-grouse areas identified in this LUP will be used to determine the LUP’s effectiveness in meeting the plan’s disturbance objectives. National datasets can be used to calculate the amount of disturbance, but field office data will likely increase the accuracy of this estimate. This information will be used to answer Question 3 of the Land Use Plan Effectiveness Report.

Calculating Question 4, Land Use Plan Effectiveness: The change in estimated sage-grouse populations will be calculated from data provided by the state wildlife agencies, when available, and will be used to determine LUP effectiveness. This population data (Section I.C., Population [Demographics] Monitoring) will be used to answer Question 4 of the Land Use Plan Effectiveness Report.

Results of the effectiveness monitoring process for the LUP will be used to inform the need for finer-scale investigations, initiate adaptive management actions as described in the land use plan, initiate causation determination, and/or determine if changes to management decisions are warranted. The measures used at the broad and mid scales will provide a suite of characteristics for evaluating the effectiveness of the adaptive management strategy.

II. FINE AND SITE SCALES

Fine-scale (third-order) habitat selected by sage-grouse is described as the physical and geographic area within home ranges during breeding, summer, and winter periods. At this level, habitat suitability monitoring should address factors that affect sage-grouse use of, and movements between, seasonal use areas. The habitat monitoring at the fine and site scale (fourth order) should focus on indicators to describe seasonal home ranges for sage-grouse associated with a lek or lek group within a population or subpopulation area. Fine- and site-scale monitoring will inform LUP effectiveness monitoring (see Section I.D., Effectiveness Monitoring) and the hard and soft triggers identified in the LUP's adaptive management section.

Site-scale habitat selected by sage-grouse is described as the more detailed vegetation characteristics of seasonal habitats. Habitat suitability characteristics include canopy cover and height of sagebrush and the associated understory vegetation. They also include vegetation associated with riparian areas, wet meadows, and other mesic habitats adjacent to sagebrush that may support sage-grouse habitat needs during different stages in their annual cycle.

As described in the Conclusion (Section III), details and application of monitoring at the fine and site scales will be described in the implementation-level monitoring plan for the land use plan. The need for fine- and site-scale-specific habitat monitoring will vary by area, depending on proposed projects, existing conditions, habitat variability, threats, and land health. Examples of fine- and site-scale monitoring include: habitat vegetation monitoring to assess current habitat conditions; monitoring and evaluation of the success of projects targeting sage-grouse habitat enhancement and/or restoration; and habitat disturbance monitoring to provide localized disturbance measures to inform proposed project review and potential mitigation for project impacts. Monitoring plans should incorporate the principles outlined in the BLM's AIM strategy (Toevs et al. 2011) and in "AIM-Monitoring: A Component of the Assessment, Inventory, and Monitoring Strategy" (Taylor et al. 2014). Approved monitoring methods are:

- “BLM Core Terrestrial Indicators and Methods” (MacKinnon et al. 2011);
- The BLM’s Technical Reference “Interpreting Indicators of Rangeland Health” (Pellant et al. 2005); and,
- “Sage-Grouse Habitat Assessment Framework: Multiscale Assessment Tool” (Stiver et al. *in press*).

Other state-specific disturbance tracking models include: the BLM’s Wyoming Density and Disturbance Calculation Tool (<http://ddct.wygisc.org/>) and the BLM’s White River Data Management System in development with the USGS. Population monitoring data (in cooperation with state wildlife agencies) should be included during evaluation of the effectiveness of actions taken at the fine and site scales.

Fine- and site-scale sage-grouse habitat suitability indicators for seasonal habitats are identified in the HAF. The HAF has incorporated the Connelly et al. (2000) sage-grouse guidelines as well as many of the core indicators in the AIM strategy (Toevs et al. 2011). There may be a need to develop adjustments to height and cover or other site suitability values described in the HAF; any such adjustments should be ecologically defensible. To foster consistency, however, adjustments to site suitability values at the local scale should be avoided unless there is strong, scientific justification for making those adjustments. That justification should be provided. WAFWA MZ adjustments must be supported by regional plant productivity and habitat data for the floristic province. If adjustments are made to the site-scale indicators, they must be made using data from the appropriate seasonal habitat designation (breeding/nesting, brood-rearing, winter) collected from sage-grouse studies found in the relevant area and peer-reviewed by the appropriate wildlife management agency(ies) and researchers.

When conducting land health assessments, the BLM should follow, at a minimum, “Interpreting Indicators of Rangeland Health” (Pellant et al. 2005) and the “BLM Core Terrestrial Indicators and Methods” (MacKinnon et al. 2011). For assessments being conducted in sage-grouse designated management areas, the BLM should collect additional data to inform the HAF indicators that have not been collected using the above methods. Implementation of the principles outlined in the AIM strategy will allow the data to be used to generate unbiased estimates of condition across the area of interest; facilitate consistent data collection and rollup analysis among management units; help provide consistent data to inform the classification and interpretation of imagery; and provide condition and trend of the indicators describing sagebrush characteristics important to sage-grouse habitat (see Section I.D., Effectiveness Monitoring).

III. CONCLUSION

This Greater Sage-Grouse Monitoring Framework was developed for all of the Final Environmental Impact Statements involved in the sage-grouse planning effort. As such, it describes the monitoring activities at the broad and mid scales and provides a guide for the BLM and the USFS to collaborate with partners/other agencies to develop the land use plan- specific monitoring plan.

IV. THE GREATER SAGE-GROUSE DISTURBANCE AND MONITORING SUBTEAM MEMBERSHIP

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Attachment A. An Overview of Monitoring Commitments

	Broad and Mid Scales					Fine and Site Scales
	Implement- tation	Sagebrush Availability	Habitat Degradation	Population	Effectiveness	
<i>How will the data be used?</i>	Track and document implementation of land use plan decisions and inform adaptive management	Track changes in land cover (sagebrush) and inform adaptive management	Track changes in disturbance (threats) to sage-grouse habitat and inform adaptive management	Track trends in sage-grouse populations (and/or leks; as determined by state wildlife agencies) and inform adaptive management	Characterize the relationship among disturbance, implementation actions, and sagebrush metrics and inform adaptive management	Measure seasonal habitat, connectivity at the fine scale, and habitat conditions at the site scale, calculate disturbance, and inform adaptive management
<i>Who is collecting the data?</i>	BLM FO and USFS Forest	NOC and NIFC	National datasets (NOC), BLM FOs, and USFS Forests as applicable	State wildlife agencies through WAFWA	Comes from other broad- and mid-scale monitoring types, analyzed by the NOC	BLM FO and SO, USFS Forests and RO (with partners)
<i>How often are the data collected, reported, and made available to USFWS?</i>	Collected and reported annually; summary report every 5 years	Updated and changes reported annually; summary report every 5 years	Collected and changes reported annually; summary report every 5 years	State data reported annually per WAFWA MOU; summary report every 5 years	Collected and reported every 5 years (coincident with LUP evaluations)	Collection and trend analysis ongoing, reported every 5 years or as needed to inform adaptive management
<i>What is the spatial scale?</i>	Summarized by LUP with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by PACs (size dependent) with flexibility for reporting by other units	Summarized by MZ and LUP with flexibility for reporting by other units (e.g., PAC)	Variable (e.g., projects and seasonal habitats)
<i>What are the potential personnel and budget impacts?</i>	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment	At a minimum, current skills and capacity must be maintained; data management costs are TBD	At a minimum, current skills and capacity must be maintained; data layer purchase cost are TBD	No additional personnel or budget impacts for the BLM or the USFS	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment	Additional capacity or re-prioritization of ongoing monitoring work and budget realignment

<i>Who has primary and secondary responsibilities for reporting?</i>	1) BLM FO & SO; USFS Forest & RO 2) BLM & USFS Planning	1) NOC 2) WO	1) NOC 2) BLM SO, USFS RO, & appropriate programs	1) WAFWA & state wildlife agencies 2) BLM SO, USFS RO, NOC	1) Broad and mid scale at the NOC, LUP at BLM SO, USFS RO	1) BLM FO & USFS Forests 2) BLM SO & USFS RO
<i>What new processes/tools are needed?</i>	National implementation datasets and analysis tools	Updates to national land cover data	Data standards and rollup methods for these data	Standards in population monitoring (WAFWA)	Reporting methodologies	Data standards data storage; and reporting

FO (field office); NIFC (National Interagency Fire Center); NOC (National Operations Center); RO (regional office); SO (state office); TBD (to be determined); WO (Washington Office)

Attachment B. User and Producer Accuracies for Aggregated Ecological Systems within LANDFIRE Map Zones

LANDFIRE Map Zone Name	User Accuracy	Producer Accuracy	% of Map Zone within Historical Schroeder
Wyoming Basin	76.9%	90.9%	98.5%
Snake River Plain	68.8%	85.2%	98.4%
Missouri River Plateau	57.7%	100.0%	91.3%
Grand Coulee Basin of the Columbia Plateau	80.0%	80.0%	89.3%
Wyoming Highlands	75.3%	85.9%	88.1%
Western Great Basin	69.3%	75.4%	72.9%
Blue Mountain Region of the Columbia Plateau	85.7%	88.7%	72.7%
Eastern Great Basin	62.7%	80.0%	62.8%
Northwestern Great Plains	76.5%	92.9%	46.3%
Northern Rocky Mountains	72.5%	89.2%	42.5%
Utah High Plateaus	81.8%	78.3%	41.5%
Colorado Plateau	65.3%	76.2%	28.8%
Middle Rocky Mountains	78.6%	73.3%	26.4%
Cascade Mountain Range	57.1%	88.9%	17.3%
Sierra Nevada Mountain Range	0.0%	0.0%	12.3%
Northwestern Rocky Mountains	66.7%	60.0%	7.3%
Southern Rocky Mountains	58.6%	56.7%	7.0%
Northern Cascades	75.0%	75.0%	2.6%
Mogollon Rim	66.7%	100.0%	1.7%
Death Valley Basin	0.0%	0.0%	1.2%

There are two anomalous map zones with 0% user and producer accuracies, attributable to no available reference data for the ecological systems of interest.

User accuracy is a map-based accuracy that is computed by looking at the reference data for a class and determining the percentage of correct predictions for these samples. For example, if I select any sagebrush pixel on the classified map, what is the probability that I'll be standing in a sagebrush stand when I visit that pixel location in the field? *Commission Error* equates to including a pixel in a class when it should have been excluded (i.e., commission error = $1 - \text{user's accuracy}$).

Producer accuracy is a reference-based accuracy that is computed by looking at the predictions produced for a class and determining the percentage of correct predictions. In other words, if I know that a particular area is sagebrush (I've been out on the ground to check), what is the probability that the digital map will correctly identify that pixel as sagebrush? *Omission Error* equates to excluding a pixel that should have been included in the class (i.e., omission error = $1 - \text{producer's accuracy}$).

Attachment C. Sagebrush Species and Subspecies Included in the Selection Criteria for Building the EVT and BpS Layers

- *Artemisia arbuscula* subspecies *longicaulis*
- *Artemisia arbuscula* subspecies *longiloba*
- *Artemisia bigelovii*
- *Artemisia nova*
- *Artemisia papposa*
- *Artemisia pygmaea*
- *Artemisia rigida*
- *Artemisia spinescens*
- *Artemisia tripartita* subspecies *rupicola*
- *Artemisia tripartita* subspecies *tripartita*
- *Tanacetum nuttallii*
- *Artemisia cana* subspecies *bolanderi*
- *Artemisia cana* subspecies *cana*
- *Artemisia cana* subspecies *viscidula*
- *Artemisia tridentata* subspecies *wyomingensis*
- *Artemisia tridentata* subspecies *tridentata*
- *Artemisia tridentata* subspecies *vaseyana*
- *Artemisia tridentata* subspecies *spiciformis*
- *Artemisia tridentata* subspecies *xericensis*
- *Artemisia tridentata* variety *pauciflora*
- *Artemisia frigida*
- *Artemisia pedatifida*

Appendix E

Greater Sage-Grouse Disturbance Caps

In the USFWS's 2010 listing decision for sage-grouse, the USFWS identified 18 threats contributing to the destruction, modification, or curtailment of the sage-grouse's habitat or range (75 FR 13910 2010). The 18 threats have been aggregated into three measures:

- Sagebrush Availability (percent of sagebrush per unit area)
- Habitat Degradation (percent of human activity per unit area)
- Density of Energy and Mining (facilities and locations per unit area)

Habitat Degradation and Density of Energy and Mining will be evaluated under the Disturbance Cap and Density Cap respectively and are further described in this appendix. The three measures, in conjunction with other information, will be considered during the NEPA process for projects authorized or undertaken by the BLM.

Disturbance Cap:

This land use plan has incorporated a 3% anthropogenic disturbance cap within Greater Sage-Grouse (GRSG) Priority Habitat Management Areas (PHMAs) and the subsequent land use planning actions if the cap is met:

If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) within GRSG PHMAs in any given Biologically Significant Unit, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 hard rock mining law, valid existing rights, etc.) would be permitted by BLM within GRSG PHMAs in any given Biologically Significant Unit until the disturbance has been reduced to less than the cap.

If the 3% anthropogenic disturbance cap is exceeded on lands (regardless of land ownership) or if anthropogenic disturbance and habitat loss associated with conversion to agricultural tillage or fire exceed 5% within a project analysis area in PHMAs, then no further discrete anthropogenic disturbances (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.) will be permitted by BLM within PHMA in a project analysis area until the disturbance has been reduced to less than the cap.

The disturbance cap applies to the PHMA within both the Biologically Significant Units (BSU) and at the project authorization scale. For the BSUs, west-wide habitat degradation (disturbance) data layers (Table 1) will be used at a minimum to calculate the amount of disturbance and to determine if the disturbance cap has been exceeded as the land use plans (LUP) are being implemented. Locally collected disturbance data will be used to determine if the disturbance cap has been exceeded for project authorizations, and may also be used to calculate the amount of disturbance in the BSUs.

Although locatable mine sites are included in the degradation calculation, mining activities under the 1872 mining law may not be subject to the 3% disturbance cap. Details about locatable mining activities will be fully disclosed and analyzed in the NEPA process to assess impacts to sage-grouse and their habitat as well as to BLM goals and objectives, and other BLM programs and activities.

Formulas for calculations of the amount of disturbance in the PHMA in a BSU and or in a proposed project area are as follows:

- For the BSUs:

$$\% \text{ Degradation Disturbance} = (\text{combined acres of the 12 degradation threats}^1) \div (\text{acres of all lands within the PHMAs in a BSU}) \times 100.$$
- For the Project Analysis Area:

$$\% \text{ Degradation Disturbance} = (\text{combined acres of the 12 degradation threats}^1 \text{ plus the 7 site scale threats}^2 \text{ and acres of habitat loss}^1) \div (\text{acres of all lands within the PHMA in the project analysis area}) \times 100.$$

¹ see Table 1. ² see Table 2

The denominator in the disturbance calculation formula consists of all acres of lands classified as PHMA within the analysis area (BSU or project area). Areas that are not sage-grouse seasonal habitats, or are not currently supporting sagebrush cover (e.g., due to wildfire), are not excluded from the acres of PHMA in the denominator of the formula. Information regarding sage-grouse seasonal habitats, sagebrush availability, and areas with the potential to support sage-grouse populations will be considered along with other local conditions that may affect sage-grouse during the analysis of the proposed project area.

Density Cap:

This land use plan has also incorporated a cap on the density of energy and mining facilities at an average of one facility per 640 acres in the PHMA in a project authorization area. If the disturbance density in the PHMA in a proposed project area is on average less than 1 facility per 640 acres, the analysis will proceed through the NEPA process incorporating mitigation measures into an alternative. If the disturbance density is greater than an average of 1 facility per 640 acres, the proposed project will either be deferred until the density of energy and mining facilities is less than the cap or co-located it into existing disturbed area (subject to applicable laws and regulations, such as the 1872 Mining Law, valid existing rights, etc.). Facilities included in the density calculation (Table 3) are:

- Energy (oil and gas wells and development facilities)
- Energy (coal mines)
- Energy (wind towers)
- Energy (solar fields)
- Energy (geothermal)
- Mining (active locatable, leasable, and saleable developments)

Project Analysis Area Method for Permitting Surface Disturbance Activities:

- Determine potentially affected occupied leks by placing a four mile boundary around the proposed area of physical disturbance related to the project. All occupied leks located within the four mile project boundary and within PHMA will be considered affected by the project.
- Next, place a four mile boundary around each of the affected occupied leks.
- The PHMA within the four mile lek boundary and the four mile project boundary creates the project analysis area for each individual project. If there are no occupied leks within the four-mile project boundary, the project analysis area will be that portion of the four-mile project boundary within the PHMA.
- Digitize all existing anthropogenic disturbances identified in Table 1, the 7 additional features that are considered threats to sage-grouse (Table 2), and areas of sagebrush loss. Using 1 meter resolution NAIP imagery is recommended. Use existing local data if available.

- Calculate percent existing disturbance using the formula above. If existing disturbance is less than 3% anthropogenic disturbance or 5% total disturbance, proceed to next step. If existing disturbance is greater than 3% anthropogenic disturbance or 5% total disturbance, defer the project.
- Add proposed project disturbance footprint area and recalculate the percent disturbance. If disturbance is less than 3% anthropogenic disturbance or 5% total disturbance, proceed to next step. If disturbance is greater than 3% anthropogenic disturbance or 5% total disturbance, defer project.
- Calculate the disturbance density of energy and mining facilities (listed above). If the disturbance density is less than 1 facility per 640 acres, averaged across project analysis area, proceed to the NEPA analysis incorporating mitigation measures into an alternative. If the disturbance density is greater than 1 facility per 640 acres, averaged across the project analysis area, either defer the proposed project or co-locate it into existing disturbed area.
- If a project that would exceed the degradation cap or density cap cannot be deferred due to valid existing rights or other existing laws and regulations, fully disclose the local and regional impacts of the proposed action in the associated NEPA.

Table 1. Anthropogenic disturbance types for disturbance calculations. Data sources are described for the west-wide habitat degradation estimates (Table copied from the GRSG Monitoring Framework)

Degradation Type	Subcategory	Data Source	Direct Area of Influence	Area Source
Energy (oil & gas)	Wells	IHS; BLM (AFMSS)	5.0ac (2.0ha)	BLM WO-300
	Power Plants	Platts (power plants)	5.0ac (2.0ha)	BLM WO-300
Energy (coal)	Mines	BLM; USFS; Office of Surface Mining Reclamation and Enforcement; USGS Mineral Resources Data System	Polygon area (digitized)	Esri/Google Imagery
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Energy (wind)	Wind Turbines	Federal Aviation Administration	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	3.0ac (1.2ha)	BLM WO-300
Energy (solar)	Fields/Power Plants	Platts (power plants)	7.3ac (3.0ha)/MW	NREL
Energy (geothermal)	Wells	IHS	3.0ac (1.2ha)	BLM WO-300
	Power Plants	Platts (power plants)	Polygon area (digitized)	Esri Imagery
Mining	Locatable Developments	InfoMine	Polygon area (digitized)	Esri Imagery
Infrastructure (roads)	Surface Streets (Minor Roads)	Esri StreetMap Premium	40.7ft (12.4m)	USGS
	Major Roads	Esri StreetMap Premium	84.0ft (25.6m)	USGS
	Interstate Highways	Esri StreetMap Premium	240.2ft (73.2m)	USGS
Infrastructure (railroads)	Active Lines	Federal Railroad Administration	30.8ft (9.4m)	USGS
Infrastructure (power lines)	1-199kV Lines	Platts (transmission lines)	100ft (30.5m)	BLM WO-300
	200-399 kV Lines	Platts (transmission lines)	150ft (45.7m)	BLM WO-300
	400-699kV Lines	Platts (transmission lines)	200ft (61.0m)	BLM WO-300
	700+kV Lines	Platts (transmission lines)	250ft (76.2m)	BLM WO-300
Infrastructure (communication)	Towers	Federal Communications Commission	2.5ac (1.0ha)	BLM WO-300

Table 2. The seven site scale features considered threats to sage-grouse included in the disturbance calculation for project authorizations.

1. Coalbed Methane Ponds
2. Meteorological Towers
3. Nuclear Energy Facilities
4. Airport Facilities and Infrastructure
5. Military Range Facilities & Infrastructure
6. Hydroelectric Plants
7. Recreation Areas Facilities and Infrastructure

Definitions:

1. Coalbed Methane and other Energy-related Retention Ponds – The footprint boundary will follow the fenceline and includes the area within the fenceline surrounding the impoundment. If the pond is not fenced, the impoundment itself is the footprint. Other infrastructure associated with the containment ponds (roads, well pads, etc.) will be captured in other disturbance categories.

2. Meteorological Towers – This feature includes long-term weather monitoring and temporary meteorological towers associated with short-term wind testing. The footprint boundary includes the area underneath the guy wires.

3. Nuclear Energy Facilities – The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.

4. Airport Facilities and Infrastructure (public and private) – The footprint boundary of will follow the boundary of the airport or heliport and includes mowed areas, parking lots, hangers, taxiways, driveways, terminals, maintenance facilities, beacons and related features. Indicators of the boundary, such as distinct land cover changes, fences and perimeter roads, will be used to encompass the entire airport or heliport.

5. Military Range Facilities & Infrastructure – The footprint boundary will follow the outer edge of the disturbed areas around buildings and includes undisturbed areas within the facility's perimeter.

6. Hydroelectric Plants – The footprint boundary includes visible facilities (fence, road, etc.) and undisturbed areas within the facility's perimeter.

7. Recreation Areas & Facilities – This feature includes all sites/facilities larger than 0.25 acres in size. The footprint boundary will include any undisturbed areas within the site/facility.

Table 3. Relationship between the 18 threats and the three habitat disturbance measures for monitoring and disturbance calculations.

USFWS Listing Decision Threat	Sagebrush Availability	Habitat Degradation	Energy and Mining Density
Agriculture	X		
Urbanization	X		
Wildfire	X		
Conifer encroachment	X		
Treatments	X		
Invasive Species	X		
Energy (oil and gas wells and development facilities)		X	X
Energy (coal mines)		X	X
Energy (wind towers)		X	X
Energy (solar fields)		X	X
Energy (geothermal)		X	X
Mining (active locatable, leasable, and saleable developments)		X	X
Infrastructure (roads)		X	
Infrastructure (railroads)		X	
Infrastructure (power lines)		X	
Infrastructure (communication towers)		X	
Infrastructure (other vertical structures)		X	
Other developed rights-of-way		X	

Appendix F

GRSG Regional Mitigation Strategy

In undertaking BLM management actions, and, consistent with valid existing rights and applicable law, in authorizing third party actions that result in habitat loss and degradation, the BLM will require and ensure mitigation that provides a net conservation gain to the species including accounting for any uncertainty associated with the effectiveness of such mitigation. This will be achieved by avoiding, minimizing, and compensating for impacts by applying beneficial mitigation actions. Mitigation will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 CFR 1508.20; e.g. avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy. If impacts from BLM management actions and authorized third party actions that result in habitat loss and degradation remain after applying avoidance and minimization measures (i.e. residual impacts), then compensatory mitigation projects will be used to provide a net conservation gain to the species. Any compensatory mitigation will be durable, timely, and in addition to that which would have resulted without the compensatory mitigation (see glossary).

The BLM, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy that will inform the NEPA decision making process including the application of the mitigation hierarchy for BLM management actions and third party actions that result in habitat loss and degradation. A robust and transparent Regional Mitigation Strategy will contribute to greater sage-grouse habitat conservation by reducing, eliminating, or minimizing threats and compensating for residual impacts to greater sage-grouse and its habitat.

The BLM's Regional Mitigation Manual MS-1794 serves as a framework for developing and implementing a Regional Mitigation Strategy. The following sections provide additional guidance specific to the development and implementation of a WAFWA Management Zone Regional Mitigation Strategy.

Developing a WAFWA Management Zone Regional Mitigation Strategy

The BLM, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy to guide the application of the mitigation hierarchy for BLM management actions and third party actions that result in habitat loss and degradation. The Strategy should consider any State-level greater sage-grouse mitigation guidance that is consistent with the requirements identified in this Appendix. The Regional Mitigation Strategy should be developed in a transparent manner, based on the best science available and standardized metrics.

As described in Chapter 2, the BLM will establish a WAFWA Management Zone Greater Sage-Grouse Conservation Team (hereafter, Team) to help guide the conservation of greater sage-grouse, within 90 days of the issuance of the Record of Decision. The Strategy will be developed within one year of the issuance of the Record of Decision.

The Regional Mitigation Strategy should include mitigation guidance on avoidance, minimization, and compensation, as follows:

Avoidance

Include avoidance areas (e.g. right-of-way avoidance/exclusion areas, no surface occupancy areas) already included in laws, regulations, policies, and/or land use plans (e.g. Resource Management Plans, Forest Plans, State Plans); and,

Include any potential, additional avoidance actions (e.g. additional avoidance best management practices) with regard to greater sage-grouse conservation.

Minimization

Include minimization actions (e.g. required design features, best management practices) already included in laws, regulations, policies, land use plans, and/or land-use authorizations; and,

Include any potential, additional minimization actions (e.g. additional minimization best management practices) with regard to greater sage-grouse conservation.

Compensation

Include discussion of impact/project valuation, compensatory mitigation options, siting, compensatory project types and costs, monitoring, reporting, and program administration. Each of these topics is discussed in more detail below.

Residual Impact and Compensatory Mitigation Project Valuation Guidance

A common standardized method should be identified for estimating the value of the residual impacts and value of the compensatory mitigation projects, including accounting for any uncertainty associated with the effectiveness of the projects.

This method should consider the quality of habitat, scarcity of the habitat, and the size of the impact/project. For compensatory mitigation projects, consideration of durability (see glossary), timeliness (see glossary), and the potential for failure (e.g. uncertainty associated with effectiveness) may require an upward adjustment of the valuation.

The resultant compensatory mitigation project will, after application of the above guidance, result in proactive conservation measures for Greater Sage-grouse (consistent with BLM Manual 6840 – Special Status Species Management, section .02).

Compensatory Mitigation Options

Options for implementing compensatory mitigation should be identified, such as:

- Utilizing certified mitigation/conservation bank or credit exchanges.
- Contributing to an existing mitigation/conservation fund.
- Authorized-user conducted mitigation projects.

For any compensatory mitigation project, the investment must be additional (i.e. additionality: the conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project).

Compensatory Mitigation Siting

Sites should be in areas that have the potential to yield a net conservation gain to the greater sage-grouse, regardless of land ownership.

Sites should be durable (see glossary).

Sites identified by existing plans and strategies (e.g. fire restoration plans, invasive species strategies, healthy land focal areas) should be considered, if those sites have the potential to yield a net conservation gain to greater sage-grouse and are durable.

Compensatory Mitigation Project Types and Costs

Project types should be identified that help reduce threats to greater sage-grouse (e.g. protection, conservation, and restoration projects).

Each project type should have a goal and measurable objectives.

Each project type should have associated monitoring and maintenance requirements, for the duration of the impact.

To inform contributions to a mitigation/conservation fund, expected costs for these project types (and their monitoring and maintenance), within the WAFWA Management Zone, should be identified.

Compensatory Mitigation Compliance and Monitoring

Mitigation projects should be inspected to ensure they are implemented as designed, and if not, there should be methods to enforce compliance.

Mitigation projects should be monitored to ensure that the goals and objectives are met and that the benefits are effective for the duration of the impact.

Compensatory Mitigation Reporting

Standardized, transparent, scalable, and scientifically-defensible reporting requirements should be identified for mitigation projects.

Reports should be compiled, summarized, and reviewed in the WAFWA Management Zone in order to determine if greater sage-grouse conservation has been achieved and/or to support adaptive management recommendations.

Compensatory Mitigation Program Implementation Guidelines

Guidelines for implementing the State-level compensatory mitigation program should include holding and applying compensatory mitigation funds, operating a transparent and credible accounting system, certifying mitigation credits, and managing reporting requirements.

Incorporating the Regional Mitigation Strategy into NEPA Analyses

The BLM will include the avoidance, minimization, and compensatory recommendations from the Regional Mitigation Strategy in one or more of the NEPA analysis' alternatives for BLM management actions and third party actions that result in habitat loss and degradation and the appropriate mitigation actions will be carried forward into the decision.

Implementing a Compensatory Mitigation Program

The BLM need to ensure that compensatory mitigation is strategically implemented to provide a net conservation gain to the species, as identified in the Regional Mitigation Strategy. In order to align with existing compensatory mitigation efforts, this compensatory mitigation program will be managed at a State-level (as opposed to a WAFWA Management Zone or Field Office), in collaboration with our partners (e.g. Federal, Tribal, and State agencies).

To ensure transparent and effective management of the compensatory mitigation funds, the BLM will enter into a contract or agreement with a third-party to help manage the State-level compensatory mitigation funds, within one year of the issuance of the Record of Decision. The selection of the third-party compensatory mitigation administrator will conform to all relevant laws, regulations, and policies. The BLM will remain responsible for making decisions that affect Federal lands.

Glossary of Terms used in this Appendix

Additionality: The conservation benefits of compensatory mitigation are demonstrably new and would not have resulted without the compensatory mitigation project. (Adopted and modified from BLM Manual Section 1794).

Avoidance mitigation: Avoiding the impact altogether by not taking a certain action or parts of an action. (40 CFR 1508.20(a)) (e.g. may also include avoiding the impact by moving the proposed action to a different time or location.)

Compensatory mitigation: Compensating for the (residual) impact by replacing or providing substitute resources or environments. (40 CFR 1508.20)

Compensatory mitigation projects: The restoration, creation, enhancement, and/or preservation of impacted resources (adopted and modified from 33 CFR 332), such as on-the-ground actions to improve and/or protect habitats (e.g. chemical vegetation treatments, land acquisitions, conservation easements). (Adopted and modified from BLM Manual Section 1794).

Compensatory mitigation sites: The durable areas where compensatory mitigation projects will occur. (Adopted and modified from BLM Manual Section 1794).

Durability (protective and ecological): the maintenance of the effectiveness of a mitigation site and project for the duration of the associated impacts, which includes resource, administrative/legal, and financial considerations. (Adopted and modified from BLM Manual Section 1794).

Minimization mitigation: Minimizing impacts by limiting the degree or magnitude of the action and its implementation. (40 CFR 1508.20 (b))

Residual impacts: Impacts that remain after applying avoidance and minimization mitigation; also referred to as unavoidable impacts.

Timeliness: The lack of a time lag between impacts and the achievement of compensatory mitigation goals and objectives (BLM Manual Section 1794).

Appendix G

Appendix G.1 - Fluid Mineral Stipulations

Summary List of Stipulations

Note that, in addition, some right-of-way (ROW) actions may affect fluid mineral operations. A summary of ROW restrictions can be found in Appendix R.

Air Resources:

Management Decision 1: Controlled Surface Use. Tier 4 Engine Requirements - Nitrogen Oxides.

Water Resources:

Management Decision 1: NSO. Wetlands, Riparian Areas, Floodplains

Management Decision 2: CSU. Water, Riparian, Wetlands

Management Decision 4: NSO. Source Water Protection Areas

Soil Resources:

Management Decision 1: CSU. Sensitive Soils

Management Decision 3: NSO. Badlands and Rock Outcrop.

Wildlife:

Management Decision 2: NSO. Sharp-Tailed Grouse and Greater Prairie-Chicken Leks

Management Decision 5: CSU. Sharp-Tailed Grouse and Prairie Chicken Nesting Area - Raptor Perches

Management Decision 6: CSU. Sharp-Tailed Grouse and Greater Prairie-Chicken - Underground Utility (Power and Transmission) Lines

Management Decision 7: TLS. Big Game Winter Range

Management Decision 9: NSO. Raptor Nest Sites Not Defined as Sensitive and Special Status

Management Decision 10: TLS. Active Raptor Nest Sites

Management Decision 16: NSO. Bighorn Sheep Range

Management Decision 20: NSO. Colonial Nesting Water Birds

Management Decision 21: TLS. Colonial Nesting Water Birds

Special Status Species:

Management Decision 1: NSO. Bald Eagle Nests

Management Decision 4: NSO. Peregrine Falcon Nests

Management Decision 6: NSO. Special Status Raptor Nests

Management Decision 7: TLS. Special Status Species Raptor Nests

Management Decision 11: NSO. Greater Sage-Grouse Leks

Management Decision 14: TLS. Greater Sage-Grouse Winter Range

Management Decision 16: CSU. Greater Sage-Grouse Nesting Habitat

Management Decision 18: CSU. Greater Sage-Grouse General Habitat (GHMAs) - Underground Utility (Power and Transmission) Lines

Management Decision 22: NSO. Greater Sage-Grouse Protection Habitat (PHMAs)

Management Decision 28: NSO. Sage Grouse Winter Range in PHMAs

Management Decision 34: NSO. Piping Plover Habitat

Management Decision 36: NSO. Interior Least Tern Habitat

Management Decision 38: LN. Sprague's Pipit Habitat

Management Decision 43: LN. Prairie Dog Habitat

Management Decision 46: LN. Black-footed Ferret Habitat

Management Decision 49: LN. Pallid and Shovel-nosed Sturgeon

Fisheries and Aquatics:

Management Decision 4: NSO. Fisheries and Aquatics

Visual Resources:

Management Decision 2: CSU. VRM Facilities Camouflage

Management Decision 3: NSO. VRM Special Recreation Management Areas

Recreation:

Management Decision 12: NSO. Recreation - SRMAs

Lands and Realty:

Management Decision 2: ROW Authorizations for Visual Resources and Wildlife

Public Safety:

Management Decision 1: NSO. Abandoned Minuteman Missile Sites

Management Decision 2: Closed. – Black Hills Army Depot (BHAD)

Cultural Resources:

Management Decision 3: NSO: National Register of Historic Places (NRHP) Eligible Properties/Districts and Traditional Cultural Properties

Management Decision 4: NSO and Closed. Igloo and Black Hills Army Depot (BHAD)

Management Decision 5: NSO: National Historic Trails

Management Decision 28: LN: Cultural Resources and Tribal Consultation

Management Decision 29: Cultural Resource Survey Requirements

Paleontological Resources:

Management Decision 1: LN: Paleontological Surveys and CSU in Potential Fossil Yield Classes 3, 4 and 5

Management Decision 11: NSO: Designated Paleontological Sites/Localities

When applicable, stipulations developed for oil and gas development may be applied to other resource uses and activities pending environmental review at the project level (implementation level).

BLM would inform affected landowners, local government, SD GFP and SD DENR when a waiver, exception or modification is being considered if such an action would directly affect resources or uses managed by these parties.

Waivers, Exceptions and Modification (WEMs)

Waivers, exceptions and modifications (WEMs) provide an effective means of applying “Adaptive Management” techniques to oil and gas leases and associated permitting activities to meet changing circumstances. The criteria for approval of waivers, exceptions, and modifications should be supported by National Environmental Policy Act (NEPA) analysis, either through the land use planning process or site-specific environmental review. An exception, waiver, or modification must be based on one of two criteria. According to 43 CFR 3101.1-4, “A stipulation included in an oil and gas lease shall be subject to modification or waiver only if the authorized officer determines that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or if the proposed operations will not cause unacceptable impacts.”

Definitions from BLM IM 2008-032

A Lease Stipulation is a condition of lease issuance that provides a level of protection for other resource values or land uses by restricting lease operations during certain times or locations or to avoid unacceptable impacts, to an extent greater than standard lease terms or regulations. A stipulation is an enforceable term of the lease contract, supersedes any inconsistent provisions of the standard lease form, and is attached to and made a part of the lease. Lease stipulations further implement the Bureau of Land Management’s (BLM) regulatory authority to protect resources or resource values. Lease stipulations are developed through the land use planning process.

A Condition of Approval (COA) means a site-specific and enforceable requirement included in an approved Application for Permit to Drill (APD) or Sundry Notice that may limit or amend the specific actions proposed by the operator.

Conditions of Approval mitigate impacts to resource values or other uses of public lands. Refer to Appendix G-6 for more details.

Note: While the term lease “stipulation” is used frequently in this document, it should be noted that the concepts contained within this policy can also be applied with some adaptation to Terms and Conditions and to Conditions of Approval.

A waiver is a permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

An exception is a one-time exemption for a particular site within the leasehold; exceptions are determined on a case-by-case basis; the stipulation continues to apply to all other sites within the leasehold. An exception is a limited type of waiver.

A modification is a change to the provisions of a lease stipulation, either temporarily or for the term of the lease. Depending on the specific modification, the stipulation may or may not apply to all sites within the leasehold to which the restrictive criteria are applied.

Stipulations for the Approved South Dakota RMP Plan

Air Resources: Management Decision 1:

Resource: Air Resources

Stipulation: Controlled Surface Use Stipulation: Surface occupancy or use is subject to the following special operating constraint: Ensure that each diesel-fueled nonroad engine with greater than 200 horsepower (hp) design rating to be used during drilling or completion activities meets one of the following two criteria: (1) the engine was manufactured to meet U.S. Environmental Protection Agency (EPA) nitrogen oxides (NO_x) emission standards for Tier 4 nonroad diesel engines, or (2) the engine emits NO_x at rates less than or equal to EPA emission standards for Tier 4 nonroad diesel engines. Any changes to this stipulation will be made in accordance with the land use plan and/or the regulatory provisions for such changes.

Objective: For the purpose of: Protecting air resources and ensuring compliance with the 1-hour nitrogen dioxide (NO₂) National Ambient Air Quality Standard (NAAQS).

Exception: An exception may be granted by the authorized officer if air quality modeling, air quality monitoring, or other information demonstrates compliance with the 1-hour NO₂ NAAQS.

Modification: This stipulation may be modified if the EPA or the South Dakota Department of Environment and Natural Resources (DENR) deletes, or revises NO_x emission standards for drill rig, completion rig, or nonroad engines.

Waiver: The stipulation may be waived if air quality modeling, air quality monitoring, or other information demonstrates that all drilling and completion activity within the lease area will meet the 1-hour NO₂ NAAQS. The stipulation may also be waived if the 1-hour NO₂ NAAQS is revoked or otherwise rendered inapplicable to drilling/completion operations.

Water Resources: Management Decision 1

Resource: Water, Riparian, Wetland, Floodplains

Stipulation: No Surface Occupancy: Surface occupancy and use is prohibited within perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas.

Objective: To protect the unique biological and hydrological features and functions associated with perennial and intermittent streams, lakes, ponds, reservoirs, floodplains, wetlands, and riparian areas.

- Exception:** No exceptions will be allowed in streams, natural lakes, or wetlands. An exception may be granted by the authorized officer for riparian areas, floodplains, and artificial ponds or reservoirs if the operator can demonstrate that: (1) there are no practicable alternatives to locating facilities in these areas, (2) the proposed actions will maintain or enhance resource functions, and (3) all reclamation goals and objectives will be met.
- Modification:** The authorized officer may modify the boundaries of the stipulated area if it is determined that portions of the leasehold do not include these types of areas.
- Waiver:** The authorized officer may waive this stipulation if it is determined that the entire leasehold does not include these types of areas.

Water Resources: Management Decision 2

- Resource:** Water, Riparian, Wetlands
- Stipulation:** Controlled Surface Use: Surface occupancy and use will be controlled within 300 feet of riparian and/or wetland areas. Surface-disturbing activities will require a plan with design features that demonstrate how all actions will maintain and/or improve the functionality of riparian/wetland areas. The plan will address: (a) potential impacts to riparian and wetland resources, (b) mitigation to reduce impacts to acceptable levels (including timing restrictions), (c) post project restoration, and (d) monitoring (the operator must conduct monitoring capable detecting early signs of changing riparian and/or wetland conditions).
- Objective:** To protect the unique biological and hydrological features associated with wetland and riparian areas. Disturbances adjacent to wetland and/or riparian areas (including road use) can adversely impact these sensitive areas. This stipulation will protect these features from indirect effects produced within the adjacent ground. This will also encompass the floodplain along most first to third order streams.
- Exception:** The Authorized Officer (AO) may grant an exception to this stipulation if the operator can demonstrate that the proposed action will not adversely impact wetland or riparian function or associated water quality.
- Modification:** The area affected by this stipulation can be modified by the AO if it is determined that portions of the lease area do not contain wetlands or riparian areas.
- Waiver:** This stipulation can be waived by the AO if it is determined that the entire lease area does not contain wetlands or riparian areas.

Water Resources: Management Decision 4

- Resource:** Source Water Protection Areas
- Stipulation:** No Surface Occupancy: Surface occupancy and use is prohibited within State-designated Source Water Protection Areas.
- Objective:** To protect human health by minimizing the potential contamination of public water systems. Source water is untreated water from streams, rivers, lakes, or aquifers used to supply public water systems. Ensuring that source water is protected from contamination can reduce the costs of treatment and risks to public health. This stipulation will protect the State-designated Source Water Protection Areas that protect public water systems from potential contamination.
- Exception:** The authorized officer may not grant exceptions to this stipulation.

- Modification:** The authorized officer may modify the boundaries of the stipulated area if it is determined that portions of the leasehold do not include Source Water Protection Areas.
- Waiver:** The authorized officer may waive this stipulation if it is determined that the entire leasehold does not include Source Water Protection Areas.

Soil Resources: Management Decision 1

- Resource:** Sensitive Soils
- Stipulation:** Controlled Surface Use: Surface occupancy and use will be controlled on sensitive soils. Prior to surface disturbance on sensitive soils, a reclamation plan must be approved by the Authorized Officer (AO). The plan must demonstrate the following: (1) no other practicable alternatives exist for relocating the activity, (2) the activity will be located to reduce impacts to soil and water resources, (3) site productivity will be maintained or restored, (4) surface runoff and sedimentation will be adequately controlled, (5) on- and off-site areas will be protected from accelerated erosion, (6) that no areas susceptible to mass wasting will be disturbed and (7) surface-disturbing activities will be prohibited during extended wet periods.
- Objective:** To maintain the chemical, physical, and biotic properties of soils. This includes maintaining soil productivity, soil stability, and soil biotic communities. This will prevent excessive erosion, potential mass wasting, and improve the likelihood of successful reclamation.
- Exception:** The AO may grant an exception to this stipulation if the operator can demonstrate that the proposed action will not contribute to degradation of the soil resource (e.g. excessive soil erosion, mass wasting, and/or lost productivity) or downslope resource conditions (e.g. reduced water quality due to sedimentation).
- Modification:** The AO may modify the area affected by this stipulation if it is determined that portions of the leasehold do not contain sensitive soils.
- Waiver:** The AO may waive this stipulation if it is determined that the entire leasehold does not contain sensitive soils.

Soil Resources: Management Decision 3

- Resource:** Badlands, Rock Outcrop
- Stipulation:** No Surface Use: Surface occupancy and use is prohibited on badlands and rock outcrop.
- Objective:** To prevent excessive soil erosion and to avoid disturbing areas subject to potential reclamation problems.
- Exception:** The authorized officer may not grant exceptions to this stipulation.
- Modification:** The authorized officer may modify the area affected by this stipulation if it is determined that portions of the leasehold do not include these types of areas.
- Waiver:** The authorized officer may waive this stipulation if it is determined that the entire leasehold does not include these types of areas.

Wildlife: Management Decision 2

- Resource:** Sharp-Tailed Grouse and Greater Prairie-Chicken Leks

Stipulation:	Controlled Surface Use: Oil and gas leasing within 2 miles of a lek will be subject to a plan approved by BLM that provides adequate mitigation measures and conservation actions to protect breeding, nesting, and brood-rearing habitats and limit disturbance in a manner that will support the long-term populations associated with the lek and surrounding habitat.
Objective:	Protection of sharp-tailed grouse and greater prairie-chicken nesting and brood rearing habitat.
Exception:	An exception to this stipulation can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.
Modification:	The boundaries of the stipulated area can be modified if the AO determines that portions of the area no longer are within 2 mile of sharp-tailed grouse and greater prairie-chicken leks.
Waiver:	This stipulation can be waived if the AO determines that the entire leasehold no longer is within 2 mile of sharp-tailed grouse and greater prairie-chicken leks.

Wildlife: Management Decision 5

Resource:	Sharp-Tailed Grouse and Greater Prairie-Chicken Nesting Area Raptor Perches
Stipulation:	Controlled Surface Use: Structures that are over 10 feet in height that create raptor perches will not be authorized or will require anti-perch devices within the 2 mile buffer of sharp-tailed grouse and greater prairie-chicken leks.
Objective:	Reduce raptor predation of sharp-tailed grouse and greater prairie-chickens in nesting areas.
Exception:	None.
Modification:	None.
Waiver:	This stipulation can be waived if the AO determines that the entire leasehold no longer contains sharp-tailed or greater prairie-chicken nesting habitat within 2 miles of a lek.

Wildlife: Management Decision 6

Resource:	Sharp-Tailed Grouse and Greater Prairie-Chickens - Underground Utility (Power and Transmission) Lines
Stipulation:	Controlled Surface Use: Power lines must be buried, designed or sited in a manner which does not impact sharp-tailed grouse or greater prairie-chickens within a 2 mile buffer of leks.
Objective:	Reduce hazards to grouse and greater prairie-chickens from power lines and reduce raptor predation of sharp-tailed grouse and greater prairie-chickens in nesting areas.
Exception:	None.
Modification:	None.
Waiver:	This stipulation can be waived if the AO determines that the entire leasehold no longer contains sharp-tailed or greater prairie-chicken nesting habitat within 2 miles of a lek.

Wildlife: Management Decision 7

Resource:	Big Game Winter Range
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- Stipulation:** Controlled Surface Use: Prior to surface occupancy and use a plan shall be prepared by the proponent as a component of the APD, Sundry Notice, etc. and approved by the authorized officer with confirmation from the state wildlife management agency. The operator shall not initiate surface-disturbing activities unless the authorized officer has approved the plan. The plan must demonstrate to the authorized officer's satisfaction the function and suitability of the habitat will not be impaired.
- Objective:** Maintain big game habit and avoid or minimize habitat loss and disturbance.
- Exception:** An exception to this stipulation can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification:** The boundaries of the stipulated area can be modified if the AO determines that portions of the area no longer contain crucial winter range for wildlife.
- Waiver:** This stipulation can be waived if the AO determines that the entire leasehold no longer contains crucial winter range for wildlife.

Wildlife: Management Decision 9

- Resource:** Raptor nest sites not defined as special status raptors that were active within the last 7 years
- Stipulation:** No Surface Occupancy: Surface occupancy and use is prohibited within ¼ mile of raptor nests sites active within the last 7 years.
- Objective:** Limit nesting disturbance to raptors that are not identified as special status raptor species.
- Exception:** An exception to this stipulation can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification:** The boundaries of the stipulated area can be modified if the AO determines that portions of the area are no longer within ¼ mile of raptor nest sites active within the past 7 years.
- Waiver:** This stipulation can be waived if the AO determines that the entire leasehold no longer is within ¼ mile of raptor nest sites active within the past 7 years.

Wildlife: Management Decision 10

- Resource:** Raptor nest sites that were active within the last 7 years
- Stipulation:** Timing Limit: Surface use is prohibited within ½ mile of active raptor nest sites from March 1 through July 31.
- Objective:** Limit nesting disturbance to raptors.
- Exception:** An exception to this stipulation can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification:** The boundaries of the stipulated area can be modified if the AO determines that portions of the area are no longer within ½ mile of raptor nest sites active within the past 7 years.

Waiver: This stipulation can be waived if the AO determines that the entire leasehold no longer is within ½ mile of raptor nest sites active within the past 7 years.

Wildlife: Management Decision 16

Resource: Bighorn Sheep Range

Stipulation: No Surface Occupancy: Surface occupancy and use will not be allowed in occupied or SDGFP proposed bighorn sheep range.

Objective: Limit disturbance to bighorn sheep.

Exception: None.

Modification: The boundaries of the stipulated area may be modified if the Authorized Officer (AO) determines that portions of the area no longer contain bighorn sheep habitat.

Waiver: This stipulation may be waived if the AO determines that the entire leasehold no longer contains bighorn sheep habitat.

Wildlife: Management Decision 20

Resource: Colonial Nesting Water-Birds

Stipulation: No Surface Occupancy: Surface occupancy and use is prohibited within ¼ mile of waterbird nesting colonies.

Objective: Limit disturbance to Colonial Nesting Water-Birds.

Exception: None.

Modification: The boundaries of the stipulated area may be modified if the Authorized Officer (AO) determines that portions of the area no longer contain colonial nesting water-birds.

Waiver: This stipulation may be waived if the AO determines that the entire leasehold no longer contains colonial nesting water-birds.

Wildlife: Management Decision 21

Resource: Colonial Nesting Water-Birds

Stipulation: Timing Limit: Surface disturbing and disruptive activities will be prohibited within ½ mile of waterbird nesting colonies from April 1 through July 15.

Objective: Limit disturbance to colonial nesting water-birds.

Exception: None.

Modification: The boundaries of the stipulated area may be modified if the Authorized Officer (AO) determines that portions of the area no longer contain colonial nesting water-birds.

Waiver: This stipulation may be waived if the AO determines that the entire leasehold no longer contains colonial nesting water-birds.

Special Status Species: Management Decision 1

Resource:	Bald Eagle Nests
Stipulation:	No Surface Occupancy: Surface occupancy and use is prohibited within ½ mile of bald eagle nest sites active within the preceding 5 years.
Objective:	Limit disturbance to bald eagle nesting habitat.
Exception:	An exception can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates that the proposed action will not affect bald eagles or their habitat. If the AO determines that the action can affect bald eagles or their habitat, consultation with the USFWS will be required prior to final determination on the exception.
Modification:	The boundaries of the stipulated area can be modified if the AO, in consultation with the USFWS, determines that portions of the area can be occupied without adversely affecting bald eagle nest sites or nesting habitat.
Waiver:	This stipulation can be waived if the AO, in consultation with the USFWS, determines that the entire leasehold can be occupied without adversely affecting bald eagle nest sites or nesting habitat or the bald eagle is declared recovered and no longer protected under the Endangered Species Act of 1973.

Special Status Species: Management Decision 4

Resource:	Peregrine Falcon Nests
Stipulation:	No Surface Occupancy: No surface occupancy or use within 1 mile of peregrine nesting sites active within the preceding 7 breeding seasons.
Objective:	Limit disturbance to peregrine falcon nesting habitat.
Exception:	An exception may be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates that the proposed action will not affect the peregrine falcon or its habitat. If the AO determines that the action may or will have an adverse effect, the operator may submit a plan demonstrating that the impacts can be adequately mitigated. This plan must be approved by the BLM in consultation with the USFWS.
Modification:	The boundaries of the stipulated area may be modified if the AO, in consultation with the USFWS, determines that portions of the area are no longer critical to the peregrine falcon.
Waiver:	The stipulation maybe waived if the AO, in consultation with the USFWS, determines that the entire leasehold no longer contains habitat critical to the peregrine falcon or the peregrine falcon is declared recovered and no longer protected under the Endangered Species Act.

Special Status Raptors: Management Decision 6

Resource:	Golden eagle, burrowing owl, ferruginous hawk, Swainson's hawk, osprey, prairie falcon, and northern goshawk. Does not include peregrine falcon or bald eagle.
Stipulation:	No Surface Occupancy: No surface occupancy or use within ¼ mile of special status raptor nests.
Objective:	Limit nesting disturbance to raptors that have been identified as special status raptor species.

- Exception:** An exception to this stipulation can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification:** The boundaries of the stipulated area can be modified if the AO determines that portions of the area are no longer within ¼ mile of raptor nest sites.
- Waiver:** This stipulation can be waived if the AO determines that the entire leasehold no longer is within ¼ miles of raptor nest sites.

Special Status Raptors: Management Decision 7

- Resource:** Golden eagle, burrowing owl, ferruginous hawk, Swainson's hawk, osprey, prairie falcon, and northern goshawk. Does not include peregrine falcon or bald eagle.
- Stipulation:** **Timing Limit:** Surface use is prohibited within ½ mile of active raptor nest sites from March 1 through July 31.
- Objective:** Limit nesting disturbance to raptors that have been identified as special status raptor species.
- Exception:** An exception to this stipulation can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification:** The boundaries of the stipulated area can be modified if the AO determines that portions of the area are no longer within ½ mile of raptor nest sites.
- Waiver:** This stipulation can be waived if the AO determines that the entire leasehold no longer is within ½ miles of raptor nest sites.

Special Status Species: Management Decision 11

- Resource:** Greater Sage-Grouse General Habitat Leks
- Stipulation:** No Surface Occupancy: No surface occupancy or use within 6/10 of a mile from leks.
- Objective:** Limit disturbance to sage-grouse nesting habitat.
- Exception:** The Authorized Officer may grant an exception only where the proposed action:
- (i) Will not have direct, indirect, or cumulative effects on GRSG or its habitat; or,
 - (ii) Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and will provide a clear conservation gain to GRSG.
- Exceptions based on conservation gain (ii) may only be considered in (a) PHMAs of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMP. (See further requirements in the WEMs preamble near the beginning of Appendix G.1.)
- Modification:** None.
- Waiver:** The AO may waive this stipulation if no portion of the leasehold is within 6/10 mile of the perimeter of an active lek.

Special Status Species: Management Decision 14

Resource:	Greater Sage-Grouse
Stipulation:	No Surface Occupancy: Sage-grouse crucial winter range will be managed as a No Surface Occupancy for oil and gas development and exploration.
Objective:	Within the sage-grouse General Habitat, maintain integrity of the habitat to support sustainable sage-grouse populations.
Exception:	<p>The Authorized Officer may grant an exception only where the proposed action:</p> <ul style="list-style-type: none"> (i) Will not have direct, indirect, or cumulative effects on GRSG or its habitat; or, (ii) Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and will provide a clear conservation gain to GRSG. <p>Exceptions based on conservation gain (ii) may only be considered in (a) PHMAs of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMP. (See further requirements in the WEMs preamble near the beginning of Appendix G.1.)</p>
Modification:	None.
Waiver:	None.

Special Status Species: Management Decision 16

Resource:	Greater Sage-Grouse General Habitat
Stipulation:	Controlled Surface Use: Surface use prohibited within 2 miles of a lek. Surface disturbing and disruptive activities within 2 miles of a lek will be avoided unless the project proponent can clearly demonstrate that the impacts can be adequately mitigated and conservation actions or needed design features are included and the goals of this plan not compromised.
Objective:	Within the Greater Sage-Grouse General Habitat, maintain integrity of the habitat, to support sustainable sage-grouse populations.
Exception:	<p>The Authorized Officer (AO) may grant an exception to specific requirements of this stipulation if the action, as proposed or conditioned will not compromise the habitat for sage-grouse and meet the goals for sage-grouse habitat.</p> <ul style="list-style-type: none"> a) Surface disturbing/disruptive activities will prevent or minimize disturbance to Greater Sage-Grouse or their habitat. Except as identified above or during emergency situations, activities will not compromise the habitat. b) Continuous noise (related to long-term operations and/or activities) will be no greater than 49 decibels at ¼ mile from the perimeter of the lek. c) Temporary noise (related to installation, maintenance, one-time use, emergency operations, etc.) exceeding 49 decibels at ¼ mile from the perimeter of a lek or surface disturbing/ disruptive activities may be allowed, but only from 10 a.m. to 4 p.m. between March 15 and May 15. d) Manage water developments to reduce the spread of West Nile virus within sage-grouse habitat areas. e) Site and/or minimize linear ROW to reduce disturbance to sagebrush habitats. f) Maximize placement of new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors. g) Power lines will be buried, eliminated, designed or sited in a manner which does not impact sage-grouse.

- h) Placement of other high profile structures, exceeding 10 feet in height, will be eliminated, designed or sited in a manner which does not impact sage-grouse.
- i) Remote monitoring of production facilities must be utilized and all permit applications must contain a plan to reduce the frequency of vehicle use.
- j) Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.
- k) Restore disturbed areas at final reclamation to pre-disturbance conditions or desired plant community.
- l) Permanent (longer than 2 months) structures which create movement must be designed or sited to minimize impacts to sage-grouse.
- m) Consider use of off-site mitigation, (e.g., creation of sagebrush habitat, purchase conservation easements, or buying down grazing) with proponent dollars to offset habitat losses.
- n) Consider creation of a "Mitigation Trust Account" when impacts cannot be avoided, minimized, or effectively mitigated through other means. If approved by the BLM, the proponent may contribute funding to maintain habitat function based on the estimated cost of habitat treatments or other mitigation needed to maintain the functions of impacted habitats. Off-site mitigation should only be considered when no feasible options are available to adequately mitigate within and immediately adjacent to the impacted site, or when the off-site location will provide more effective mitigation of the impact than can be achieved on-site.

Modification: The AO may modify the area subject to the stipulation if an environmental analysis finds a portion of the General Habitat Area is nonessential or no longer sage-grouse habitat.

Waiver: This stipulation may be waived by the AO if no portion of the leasehold is within 2 miles of the perimeter of an active lek.

Special Status Species: Management Decision 18

Resource: Greater Sage-Grouse General Habitat (GHMAs) - Underground Utility (Power and Transmission) Lines

Stipulation: Controlled Surface Use: All new utility and power lines that can be safely buried will be buried within 2 miles of sage-grouse leks and within sage-grouse winter range.

When burial of power lines is not possible, above ground lines will be located and designed to minimize impacts of predation, collision and other associated stressors to sage-grouse.

Existing overhead lines within 2 miles of leks and within sage-grouse winter range will be evaluated for threats to sage-grouse and if necessary, modified to reduce the threat. If modification will not likely be effective, the overhead line may be relocated. Any requirements for modification or relocation of existing overhead lines will be subject to valid existing rights.

Objective: Reduce collision hazards to sage-grouse from power lines and reduce raptor predation on sage-grouse within Greater Sage-Grouse General Habitat (GHMAs).

Exception: None.

Modification: None.

Waiver: This stipulation may be waived, if after consultation with the appropriate State and federal wildlife agencies, it is determined that significant portions of the Greater Sage-Grouse General Habitat has been altered to the point sage-grouse no longer occupy the site and there is no reasonable likelihood of functional habitat being restored.

Special Status Species: Management Decision 22

Resource: Greater Sage-Grouse Priority Habitat Management Areas (PHMAs)

Stipulation:	No Surface Occupancy: Greater Sage-Grouse PHMAs will be managed as No Surface Occupancy and Use (127,735 surface and 412,822 oil and gas subsurface minerals acres.) These areas will be open to oil and gas leasing with a no surface occupancy stipulation. All sage-grouse habitat that is not part of PHMAs will be managed as GHMA as noted in Figure 1-2.
Objective:	Within Greater Sage-Grouse PHMAs maximize the integrity of the habitat, strive to maintain or improve sage-grouse populations, and at a minimum sage-grouse habitat so populations in the Greater Sage- Grouse PHMAs reflect population trends exhibited by representative sage-grouse trend data from SDGFP lek data (protection priority area controlled surface use).
Exception:	<p>The Authorized Officer may grant an exception only where the proposed action:</p> <ul style="list-style-type: none"> (i) Will not have direct, indirect, or cumulative effects on GRSG or its habitat; or, (ii) Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and will provide a clear conservation gain to GRSG. <p>Exceptions based on conservation gain (ii) may only be considered in (a) PHMAs of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMP. (See further requirements in the WEMs preamble near the beginning of Appendix G.1.)</p>
Modification:	None
Waiver:	None

Special Status Species: Management Decision 28

Resource:	Greater Sage-Grouse Winter Range in Priority Habitat Management Areas (PHMAs)
Stipulation:	No Surface Occupancy: Sage-grouse crucial winter range will be managed as a No Surface Occupancy for oil and gas development and exploration.
Objective:	Within Greater Sage-Grouse PHMAs maximize the integrity of the habitat, strive to maintain or improve sage-grouse populations, and at a minimum sage-grouse habitat so populations in the Greater Sage- Grouse PHMAs reflect population trends exhibited by representative sage-grouse trend data from SDGFP lek data (protection priority area controlled surface use).
Exception:	<p>The Authorized Officer may grant an exception only where the proposed action:</p> <ul style="list-style-type: none"> (i) Will not have direct, indirect, or cumulative effects on GRSG or its habitat; or, (ii) Is proposed to be undertaken as an alternative to a similar action occurring on a nearby parcel, and will provide a clear conservation gain to GRSG. <p>Exceptions based on conservation gain (ii) may only be considered in (a) PHMAs of mixed ownership where federal minerals underlie less than fifty percent of the total surface, or (b) areas of the public lands where the proposed exception is an alternative to an action occurring on a nearby parcel subject to a valid Federal fluid mineral lease existing as of the date of this RMP. (See further requirements in the WEMs preamble near the beginning of Appendix G.1.)</p>
Modification:	None.
Waiver:	None.

Special Status Species: Management Decision 34

Resource:	Piping Plover Habitat
Stipulation:	No Surface Occupancy: Surface occupancy and use will be prohibited within ¼ mile of piping plover habitat.
Objective:	Protection of piping plover habitat.
Exception:	An exception can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates that the proposed action will not affect the piping plover or its habitat. If the AO determines that the action can affect the piping plover or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
Modification:	The boundaries of the stipulated area may be modified if the AO, in consultation with USFWS, determines that portions of the area are no longer essential to the piping plover.
Waiver:	The stipulation can be waived if the AO, in consultation with USFWS, determines that the entire leasehold no longer contains habitat essential to the piping plover or the piping plover is declared recovered and is no longer protected under the Endangered Species Act of 1973.

Special Status Species: Management Decision 36

Resource:	Interior Least Tern Habitat
Stipulation:	No Surface Occupancy: Surface occupancy and use will be prohibited with ¼ miles of interior least tern habitat.
Objective:	Protection of interior least tern habitat.
Exception:	An exception can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates that the proposed action will not affect the least tern or its habitat. If the AO determines that the action can affect the least tern or its habitat, consultation with the USFWS will be required prior to final determination on the exception.
Modification:	The boundaries of the stipulated area can be modified if the AO, in consultation with the USFWS, determines that portions of the area are no longer essential to the least tern.
Waiver:	The stipulation can be waived if the AO, in consultation with the USFWS, determines that the entire leasehold no longer contains habitat essential to the least tern or the least tern is declared recovered and no longer protected under the Endangered Species Act.

Special Status Species: Management Decision 38

Resource:	Sprague's Pipit Habitat
Stipulation:	A lease notice will be attached to all leases in documented or potential habitat* for Sprague's pipit. The lease notice will notify the lease holder that mitigation and conservation actions may be required including a limit on exploration and development from April 15 to July 15. *Currently habitat is present but not well identified in western South Dakota.
Objective:	Protection of Sprague's pipit habitat.
Exception:	N/A
Modification:	N/A

Waiver: N/A

Special Status Species: Management Decision 43

Resource: Prairie Dogs

Stipulation: Controlled Surface Use: Oil and gas leasing will be open and surface occupancy and use on prairie dog colonies will be allowed provided adequate mitigation and conservation actions are implemented to maintain the functionality of the prairie dog habitat.

Objective: Protection of prairie dog habitat.

Exception: An exception can be granted by the AO if the operator submits a plan that demonstrates that the proposed action will not affect the prairie dog or its habitat. If the AO determines that the action can affect the prairie dog or its habitat and has the potential to subsequently affect the black-footed ferret, consultation with the USFWS will be required prior to final determination on the exception.

Modification: The boundaries of the stipulated area can be modified if the AO determines that portions of the area are no longer essential to the prairie dog.

Waiver: The stipulation can be waived if the AO determines that the entire leasehold no longer contains habitat essential to the prairie dog or the prairie dog is no longer considered a BLM sensitive species.

Special Status Species: Management Decision 46

Resource: Black-footed Ferret

Stipulation: No Surface Occupancy: Surface occupancy and use will be prohibited within ¼ mile of occupied black-footed ferret habitat.

Objective: Protection of Black Footed Ferret habitat.

Exception: An exception can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates that the proposed action will not affect the black-footed ferret or its habitat. If the AO determines that the action can affect the black-footed ferret or its habitat, consultation with the USFWS will be required prior to final determination on the exception.

Modification: The boundaries of the stipulated area can be modified if the AO, in consultation with the USFWS, determines that portions of the area are no longer essential to the black-footed ferret.

Waiver: The stipulation can be waived if the AO, in consultation with the USFWS, determines that the entire leasehold no longer contains habitat essential to the black-footed ferret or the black-footed ferret is declared recovered and no longer protected under the Endangered Species Act.

Special Status Species: Management Decision 49

Resource: Pallid and Shovel-Nosed Sturgeon

Stipulation: No Surface Occupancy: Surface occupancy and use is prohibited within ¼ mile of the water's edge of the Missouri River to protect pallid and shovel-nosed sturgeon.

Objective: Protection of Pallid and Shovel-Nosed Sturgeon.

Exception: An exception can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates that the proposed action will not affect the pallid and shovel-nosed sturgeon or its habitat. If the AO determines that the action can affect the pallid and shovel-nosed sturgeon or its habitat, consultation with the USFWS will be required prior to final determination on the exception.

- Modification:** The boundaries of the stipulated area can be modified if the AO, in consultation with the USFWS, determines that portions of the area are no longer essential to the pallid and shovel-nosed sturgeon.
- Waiver:** The stipulation can be waived if the AO, in consultation with the USFWS, determines that the entire leasehold no longer contains habitat essential to the pallid and shovel-nosed sturgeon or the pallid and shovel-nosed sturgeon is declared recovered and no longer protected under the Endangered Species Act.

Fisheries and Aquatics: Management Decision 4

- Resource:** Fisheries and Aquatics
- Stipulation:** No Surface Occupancy: Surface occupancy and use is prohibited within ¼ mile of designated reservoirs with fisheries.
- Objective:** Protection of fisheries and aquatics species.
- Exception:** An exception to this stipulation can be granted by the Authorized Officer (AO) if the operator submits a plan that demonstrates that impacts from the proposed action are acceptable or can be adequately mitigated.
- Modification:** The boundaries of the stipulated area can be modified if the AO determines that portions of the area can be occupied without adversely affecting the fisheries and recreational values of the reservoir.
- Waiver:** This stipulation can be waived if the AO determines that the entire leasehold is no longer a fishery, and it can be occupied without adversely affecting the recreational values of the reservoir.

Visual Resources Management (VRM): Management Decision 2

- Resource:** Visual Resources
- Stipulation:** Controlled Surface Use: Semi-permanent or permanent facilities that are not specifically prohibited in VRM Class II areas may require special design including location, size, and camouflage painting to blend with the natural surroundings and meet the visual quality objectives for the area (applies to all activities; CSU for oil and gas).
- Surface-disturbing activities in VRM Class III and IV may also require designs to reduce VRM impacts (applies to all activities; lease notice for oil and gas).
- Objective:** Protection of the aesthetic and scenic qualities of the landscape.
- Exception:** The Authorized Officer (AO) may allow temporary projects to exceed VRM standards in Class II-IV areas if the project will terminate within two years of initiation. Rehabilitation will begin at the end of the two-year period. During the temporary project, the AO may require phased mitigation to better conform to the prescribed VRM.
- Modification:** None.
- Waiver:** None.

Visual Resources Management (VRM): Management Decision 3

- Resource:** Visual Resources

Stipulation:	No Surface Occupancy: Surface occupancy and use will be prohibited in and within ½ mile of buffer of the Exemption Area SRMA. Surface occupancy and use will be prohibited within ½ mile buffer around the Fort Meade SRMA/ACEC. (Minerals will be withdrawn within the Fort Meade SRMA/ACEC.)
Objective:	Protection of the aesthetic and scenic qualities of the landscape within ½ mile of designated Special Recreation Management Areas.
Exception:	The Authorized Officer (AO) may allow temporary projects to exceed VRM standards in Class II-IV areas if the project will terminate within two years of initiation. Rehabilitation will begin at the end of the two-year period. During the temporary project, the AO may require phased mitigation to better conform to the prescribed VRM.
Modification:	None.
Waiver:	None.

Recreation: Management Decision 12

Resource:	Recreation
Stipulation:	No Surface Occupancy: Surface occupancy and use will be prohibited within ½ mile of the Special Recreational Management Areas (SRMAs) including Fort Meade ACEC and Exemption Area.
Objective:	Protection of ACEC and recreational values associated with SRMAs.
Exception:	The Authorized Officer (AO) may allow temporary projects to exceed VRM standards in Class II-IV areas if the project will terminate within two years of initiation. Rehabilitation will begin at the end of the two-year period. During the temporary project, the AO may require phased mitigation to better conform to the prescribed VRM.
Modification:	None.
Waiver:	None.

Lands and Realty, ROW Authorizations: Management Decision 2

Resource:	Visual Resources and Wildlife
Stipulation:	Controlled Surface Use: All fiber optic, telephone and power lines that can be safely buried will be buried or sited to have least impact on resources. All other utility lines will be evaluated at the project level.
Objective:	Protection of visual and scenic qualities while allowing for flexibility to avoid cultural or mitigate impacts to cultural sites.
Exception:	Areas where damage to cultural resources cannot be mitigated may be excepted by the Authorized Officer (AO).
Modification:	None.
Waiver:	None.

Public Safety: Management Decision 1

Resource:	Public Safety – Abandoned Minuteman Missile Sites
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Stipulation:	Controlled Surface Use: Surface-disturbing activity at U.S. Air Force abandoned Minuteman missile sites will be restricted on the sites and approximately 1/8 mile (approximately 200 meters) beyond the sites. Subsurface activity will be prohibited under the sites and approximately 1/8 mile (approximately 200 meters) beyond the sites.
Objective:	Protect the public and environment from movement of or contamination by potential residual hazardous waste.
Exception:	This stipulation can be excepted by the Authorized Officer (AO) if it is determined that the disturbance will not intercept and contribute to the spreading of potential residual wastes by a plan that addresses the design of the proposal, stockpiling and respreading of soil materials, and sampling and testing.
Modification:	None.
Waiver:	None.

Public Safety: Management Decision 2

Resource:	Public Safety - BHAD
Stipulation:	Closed. BHAD will be closed to oil and gas leasing and salable minerals due to public safety concerns.
Objective:	Protect the public and environment from movement of or contamination by potential residual hazardous waste.
Exception:	None.
Modification:	None.
Waiver:	None.

Cultural Resources: Management Decision 3

Resource:	Standard lease conditions (Appendix G) will be used to protect areas within <u>and around</u> cultural sites, Native American traditional use areas/Traditional Cultural Properties, and Archaeological/Historic Districts that are eligible or potentially eligible for the National Register of Historic Places.
Stipulation:	No Surface Occupancy: Surface-disturbing activities will not be allowed within and for a distance of 300 feet from the boundaries of cultural properties and archaeological/historic districts determined to be eligible or potentially eligible for the National Register of Historic Places. Standard lease conditions will not allow Surface Occupancy and Use within, and for a distance of ½ mile from the boundaries of cultural properties determined to be of importance to Native American Tribal groups, sites determined to be Traditional Cultural Properties, and/or designated for traditional use. Such properties include (but are not limited to) burial locations, pictograph/petroglyph, vision quest locations, certain stone alignments, buttes or other uplift type landforms, plant gathering locations, and areas considered sacred or used for religious purposes.
Objective	To protect significant cultural properties, archaeological districts, archaeological properties of known significance to Native American groups, traditional cultural properties, and all of their settings, and to avoid disturbance or inadvertent impacts to these resources.
Exception:	An exception to this stipulation may be granted by the Authorized Officer (AO) if the lessee or operator submits a plan which demonstrates that operations will be designed and/or located in such a

manner as to have a minimal impact to the natural setting and characteristics of the immediate area and that adverse impacts to these traditional cultural properties can be mitigated in consultation with, and to the satisfaction of, affected Indian Tribes or Native American groups. For cultural properties determined to be of importance to Native American Tribal groups, sites determined to be Traditional Cultural Properties, and/or designated for traditional use the plan must demonstrate that operations will be designed and/or located in such a manner as to have a minimal impact to the natural setting and characteristics of the immediate area and that adverse impacts to these traditional cultural properties can be mitigated in consultation with, and to the satisfaction of, affected Indian Tribes or Native American groups.

Modification: The boundaries of the stipulated area may be modified if the AO determines that portions of the designated site or district can be occupied without adversely affecting the cultural resource values for which the site or area was designated eligible. Does not apply to Traditional Cultural Properties.

Waiver: None.

NOTE: Compliance with Section 106 of NHPA is required for all actions that can affect cultural properties eligible for the National Register of Historic Places (NRHP).

Cultural Resources: Management Decision 4

Resource: Cultural Resources and Public Safety

Stipulation: Closed: Black Hills Army Depot (BHAD) National Register Historic District Site is closed to leasing.
No Surface Occupancy: Surface occupancy and use will be prohibited within the Igloo town site.

Objective: Protect significant historic properties and resources and prevent the movement of, or contamination by, potential hazardous materials within the abandoned Igloo town site and the Black Hills Army Depot.

Exception: None.

Modification: None.

Waiver: None.

Cultural Resources: Management Decision 5

Resource: National Historic Trails

Stipulation: No Surface Occupancy: Surface occupancy and use is prohibited within ½ mile of the National Trail Management Corridor of designated National Historic Trails. Designated National Historic Trails include the Lewis and Clark Trail. The River Corridor is the designated historic trail for the Lewis and Clark Trail. To protect the Lewis and Clark Trail and associated settings, this stipulation will be applied to the water portion of the Missouri River and its reservoirs and extend out ½ mile from the high water mark of the River and its reservoirs.

Objective: To protect the nature and purpose; trail resources, qualities, values, and associated settings; and primary use or uses of the historic trail, in accordance with National Trail System Act.

Exception: An exception to this stipulation may be granted by the AO if the lessee or project proponent completes a comprehensive trail inventory, as outlined in Manual 6280, and presents a proposal which demonstrates resource values are not affected or that adverse impacts can be adequately mitigated to prevent impact to:

- The nature and purposes of the National Trail.
- National Trail resources, qualities, values, and associated settings.
- National Trail primary use or uses.
- The National Trail from the cumulative or trail-wide perspective.

Modification: None

Waiver: None

Cultural Resources: Management Decision 28

Resource: Cultural Resources and Tribal Consultation

Stipulation: Lease Notice: This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Objective: To protect significant historic properties and cultural resources.

Exception: None.

Modification: None.

Waiver: None.

Cultural Resources: Management Decision 29

Resource: Cultural Resource Survey Requirements

Stipulation: An inventory of those portions of the leased lands subject to proposed disturbance may be required prior to any surface disturbance to determine if cultural resources are present and to identify needed mitigation measures. Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or operator shall:

1. The lessee or operator shall engage the services of a cultural resource consultant acceptable to the Surface Management Agency (SMA) to conduct a cultural resource inventory of the area of proposed surface disturbance. The operator may elect to inventory an area larger than the standard minimum to cover possible site relocation which may result from environmental or other considerations. Requirements for inventory methods including the size of standard APD survey areas will be followed as described in *Inventory Requirements for Proposed Well Sites, APD's - Well Pad/Block Inventory* in IM MT2015-043, or subsequent updates to this IM. An acceptable inventory report is to be submitted to the SMA for review and approval no later than that time when an otherwise complete application for approval of drilling or subsequent surface-disturbing operation is submitted.
2. Implement mitigation measures required by the SMA. Mitigation may include the relocation of proposed lease-related activities or other protective measures such as data recovery and extensive recordation. Where impacts to cultural resources cannot be mitigated to the satisfaction of the SMA, surface occupancy on that area must be prohibited. The lessee or operator shall immediately bring to the attention of the SMA any cultural resources discovered as a result of approved operations under this lease, and shall not disturb such discoveries until directed to proceed by the SMA.

Objective: Compliance with Section 106 of the National Historic Preservation Act is required for all actions which may affect cultural properties eligible to the National Register of Historic Places. Section 6 of

the Oil and Gas Lease Terms (Form 3100-11) requires that operations be conducted in a manner that minimizes adverse impacts to cultural and other resources.

Exception: None.

Modification: None.

Waiver: None.

Paleontological Resources: Management Decision 1

Resource: Paleontological Resource Inventory

Stipulation: Lease Notice: In areas known to have a high potential (Classes 3, 4 and 5) for containing significant paleontological resources, the Lessee shall be required to conduct a paleontological inventory prior to any surface disturbance. The lessee must engage the services of a qualified paleontologist, acceptable to the Surface Management Agency, to conduct the inventory. An acceptable inventory report is to be submitted to the BLM for review and approval at the time a surface-disturbing plan of operations is submitted.

Objective: Preserve and protect scientifically significant vertebrate fossils and paleontological locales.

Exception: An exception may be granted if the area has already been inventoried for paleontological resources.

Modification: None.

Waiver: None.

Paleontological Resources: Management Decision 11

Resource: Paleontological Resources

Stipulation: No Surface Occupancy: Surface occupancy and use is prohibited within designated paleontological sites/localities and in significant paleontological sites regardless of designation, except in the Fossil Cycad ACEC, which is closed to leasing.

Objective: Preserve and protect significant vertebrate fossils and paleontological resources.

Exception: An exception to this stipulation may be granted by the Authorized Officer (AO) if the lessee or operator submits a plan which demonstrates that the adverse impacts to significant paleontological resources can be mitigated through recovery and extensive recordation. Where impacts to paleontological resources cannot be mitigated to the satisfaction of the Surface Management Agency, surface occupancy on that area must be prohibited.

Modification: The boundaries of the stipulated area may be modified if the AO determines that portions of the designated paleontological site/locality can be occupied without adversely affecting the resource values or significance.

Waiver: None.

Appendix G.2

Lease Notices

Endangered Species Act Standard Lease Notice
Migratory Bird Treaty Act Standard Lease Notice
Sprague's Pipit Lease Notice
Setback from Human Occupied Residences Requirement

Common lease notices and stipulations are shown in Appendix G.2 through G.4. For a more detailed list refer to http://www.blm.gov/mt/st/en/prog/energy/oil_and_gas/leasing/stipulations.htm.

Endangered Species Act Section 7 Consultation Stipulation

O&G – Lease Notice

The lease area may now or hereafter contain plants, animals, or their habitats determined to be threatened, endangered, or other special status species. BLM may recommend modifications to exploration and development proposals to further its conservation and management objective to avoid BLM-approved activity that will contribute to a need to list such a species or their habitat. BLM may require modifications to or disapprove proposed activity that is likely to result in jeopardy to the continued existence of a proposed or listed threatened or endangered species or result in the destruction or adverse modification of a designated or proposed critical habitat. BLM will not approve any ground-disturbing activity that may affect any such species or requirements of the Endangered Species Act as amended, 16 U.S.C. § et seq., including completion of any required procedure for conference or consultation.

Migratory Bird Treaty Act Lease Notice

O&G – Lease Notice

Migratory Bird Treaty Act. The Operator is responsible for compliance with provisions of the Act by implementing one of the following measures; a) avoidance by timing; ground disturbing activities will not occur from April 15 to July 15, b) habitat manipulation; render proposed project footprints unsuitable for nesting prior to the arrival of migratory birds (blading or pre-clearing of vegetation must occur prior to April 15 within the year and area scheduled for activities between April 15 and July 15 of that year to deter nesting, or c) survey-buffer-monitor; surveys will be conducted by a BLM approved biologist within the area of the proposed action and a 300 foot buffer from the proposed project footprint between April 15 to July 15 if activities are proposed within this timeframe. If nesting birds are found, activities will not be allowed within 0.1 miles of nests until after the birds have fledged. If active nests are not found, construction activities must occur within 7 days of the survey. If this does not occur, new surveys must be conducted. Survey reports will be submitted to the appropriate BLM Office.

Sprague's Pipit Lease Notice**O&G – Lease Notice**

The lease area may contain habitat for the federal candidate Sprague's pipit. The operator may be required to implement specific measures to reduce impacts of oil and gas operations on Sprague's pipits, their habitat and overall population. Such measures will be developed during the application for permit to drill and environmental review processes, consistent with lease rights. Measures may include limits on exploration and development activities from April 15 to July 15.

If the U.S. Fish and Wildlife Service lists the Sprague's pipit as threatened or endangered under the Endangered Species Act, the BLM will enter into formal consultation on proposed permits that may affect the Sprague's pipit and its habitat. Restrictions, modifications, or denial of permits could result from the consultation process.

Setback from Human Occupied Residences Requirement**O&G – Lease Notice**

The lease area may contain human occupied residences. Under Regulation 43 CFR 3101.1-2 and terms of the lease (BLM Form 3100-11), the authorized officer may require reasonable measures to minimize adverse impacts to other resource values, land uses, and users not addressed in lease stipulations at the time operations are proposed. Such reasonable measures may include, but are not limited to, modification of siting or design of facilities, which may require relocating proposed operations up to 200 meters, but not off the leasehold.

The setback requirement of 500 feet from human occupied residences has been established based upon the best information available. The following condition of approval may be applied as a result of the Application for Permit to Drill (APD) process during the on-site inspection and the environmental review unless an acceptable plan for mitigation of impacts is reached between the resident, lessee and BLM:

- **Facilities will not be allowed within 500 feet of human occupied residences.**
The intent of this Lease Notice is to provide information to the lessee that will help design and locate oil and gas facilities to preserve the aesthetic qualities around human occupied residences.

Appendix G.3

Cultural Resources, Tribal Consultation and Paleontological Resources Standard Lease Stipulations

Cultural Resources 16-1

This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Stipulation for Cultural Resource Protection

The lease holder is not allowed to collect or give others permission to collect historic or prehistoric artifacts on Public Lands. An artifact is any human-made object or object used in its natural state by humans, which is at least 50 years old. The unauthorized collecting of prehistoric and historic artifacts on public lands is punishable under Federal law. If you observe individuals collecting artifacts, immediately notify the authorized BLM official.

Paleontological Resource Inventory Requirement

LEASE NOTICE 14-12

This lease has been identified as being located within geologic units rated as being moderate to very high potential for containing significant paleontological resources. The locations meet the criteria for Classes 3, 4 and/or 5 as set forth in the Potential Fossil Yield Classification System, WO IM 2008-009, Attachment 2-2. The BLM is responsible for assuring that the leased lands are examined to determine if paleontological resources are present and to specify mitigation measures. Guidance for application of this requirement can be found in WO IM 2008-009 dated October 15, 2007, and WO IM 2009-011 dated October 10, 2008.

Prior to undertaking any surface-disturbing activities on the lands covered by this lease, the lessee or project proponent shall contact the BLM to determine if a paleontological resource inventory is required. If an inventory is required, the lessee or project proponent will complete the inventory subject to the following:

- the project proponent must engage the services of a qualified paleontologist, acceptable to the BLM, to conduct the inventory.
- the project proponent will, at a minimum, inventory a 10-acre area or larger to incorporate possible project relocation which may result from environmental or other resource considerations.
- the paleontological inventory may identify resources that may require mitigation to the satisfaction of the BLM as directed by WO IM 2009-011.

Appendix G.4

Air Resources Lease Notices

Air Resources

The lessee/operator is given notice that prior to project-specific approval, additional air resource analyses may be required in order to comply with the National Environmental Policy Act, Federal Land Policy Management Act, and/or other applicable laws and regulations. Analyses may include equipment and operations information, emission inventory development, dispersion modeling or photochemical grid modeling for air quality and/or air quality related value (AQRV) impact analysis, and/or emission control determinations. These analyses may result in the imposition of additional project-specific control measures to protect air resources.

Appendix G.5

Offer to Lease and Lease for Oil and Gas - Form 3100-11

BLM Form 3100-11, Offer to Lease and Lease for Oil and Gas, is available by request from BLM, or at the following website:

<http://www.blm.gov/style/medialib/blm/noc/business/efrms.Par.71287.File.dat/3100-011.pdf>

Appendix G.6

Oil and Gas Supplementary Information

Procedures In Oil and Gas Recovery and Operations (BLM)

Geophysical Operations

Oil and gas reservoirs are discovered by either direct or indirect exploration methods. Direct methods include mapping of surface geology, observing oil or gas seeps, and gathering information on hydrocarbon shows observed in drilling wells. Indirect methods include various types of geophysical exploration such as seismic, gravity, and magnetic surveys, which use remote data gathering techniques to delineate subsurface structures or lithologic changes that are not directly observable, but that may contain or trap oil and gas. Data is often acquired using equipment mounted on surface vehicles or aircraft. Information from geophysical exploration can lead oil companies or others to request that lands be offered for lease, or assist in the selection of drill sites on existing leases. However, a federal oil and gas lease is not required in order to conduct geophysical operations. Existing road systems are used where available. Roads may be cleared of vegetation and loose rocks to improve access for trucks if the permit allows that action.

Blading and road construction for seismic operations are not usually allowed so that environmental impacts are minimized. In areas with rugged terrain or without access roads, and during certain seasons of the year, seismic work is conducted by helicopter rather than by ground vehicles. Other geophysical operations that do not cause additional surface disturbance include remote sensing, and gravity, and aeromagnetic surveying.

Geophysical Permitting Procedures and Regulations

Geophysical operations on and off an oil and gas lease are reviewed by the Federal Surface Management Agency (SMA), which can include the BLM, Bureau of Reclamation (BOR), Corps of Engineers (COE), U.S. Forest Service (USFS), among others. Close cooperation between the operator and the managing agency during geophysical operations minimizes surface impacts and protects other resources.

Notification Process

Geophysical operations on public lands are reviewed by the BLM. Geophysical exploration on public lands requires review and approval following the procedures in 43 CFR Subparts 3150, 3151, and 3154. In the South Dakota Field Office (SDFO), the Field Manager is authorized to approve geophysical operations. The responsibilities of the geophysical operator and the Field Manager during geophysical operations are described below.

Geophysical Operator

The operator is required to file a Notice of Intent to Conduct Oil and Gas Exploration Operations (form 3150-4) for operations on public lands administered by the BLM. Maps (preferably 1:24,000 scale topographic maps) showing the location of the proposed lines, access routes and ancillary facilities must accompany the Notice of Intent. When the Notice of Intent is filed, the authorized officer may request a prework conference or field inspection. Special requirements or procedures that are identified by the authorized officer are included in the Terms and Conditions for Notice of Intent to Conduct Geophysical Exploration (form 3150-4 and a copy of the state requirements). Any changes in the original Notice of Intent must be submitted in writing to the authorized officer. Written approval must be secured before activities proceed.

Bonding of the operator is required. A copy of proof of satisfactory bonding shall accompany the Notice of Intent. Proper bonding may include a \$5,000 individual, \$25,000 statewide, or \$50,000 nationwide geophysical exploration bond. In lieu of an exploration bond, a statewide or nationwide oil and gas bond may be used if it contains a rider for geophysical exploration. The operator is required to comply with applicable federal, state, and local laws such as Federal Land Policy and Management Act of 1976, the National Historic Preservation Act of 1966, and the Endangered Species

Act of 1973, as amended. Earth-moving equipment shall not be used without prior approval. Operators may be required to submit an archeological evaluation and the agency provide NEPA documentation for cultural and wildlife resources if

dirt work or other surface disturbance is contemplated, or if there is reason to believe that these resources may be adversely affected. When geophysical operations have been completed including any required reclamation or rehabilitation, the operator is required to file a Notice of Completion (form 3150-5) including certification that all terms and conditions of the approved Notice of Intent have been fulfilled. The operator must also submit a map that shows the actual line location, access route, and other survey details.

BLM Field Manager (authorized officer)

The authorized officer is required to contact the operator within five working days after receiving the Notice of Intent to explain the terms of the notice, including the “Terms and Conditions for Notice of Intent to Conduct Geophysical Exploration,” current laws, and BLM administrative requirements. At the time of the prework conference or field inspection, written instructions or orders are given to the operator. The authorized officer is responsible for the examination of resource values to determine appropriate surface protection and reclamation measures. Compliance inspections during the operation ensure that stipulations are followed. The authorized officer is required to make a final inspection following filing of the Notice of Completion. Compliance inspections upon completion of work ensure that required reclamation is properly completed. When reclamation is approved, obligation against the operator’s bond is released. The BLM has 30 days after receipt of the Notice of Completion to notify the operator whether the reclamation is satisfactory or if additional reclamation work is needed. Bonding liability will automatically terminate within 90 days after receipt of the Notice of Completion unless the authorized officer notifies the operator of the need for additional reclamation work.

State Standards

Geophysical operations are administered by the Department of Environment and Natural Resources. An exploration permit is not needed for activities which cause very little or no surface disturbance, such as exploration using: nonexplosive seismic energy sources, airborne surveys and photographs, and the use of instruments or devices which are hand carried or otherwise transported over the surface to make magnetic, radioactive, or other tests and measurements. A permit is required by the state for seismic energy sources using explosives, but not for vibroseis trucks.

For exploration on state owned lands, the South Dakota Department of School and Public Lands will have separate requirements which only apply to those lands.

Mitigation

When a geophysical Notice of Intent is received, restrictions may be placed on the application to protect resource values or to mitigate impacts. Many of these requirements may be the same as the oil and gas lease stipulations adopted in the RMP. Other less restrictive measures may be used when impacts to resource values will be less severe. This is due in part to the temporary nature of geophysical exploration. Seasonal restrictions may be imposed to reduce conflicts with wildlife, watershed damage, and hunting activity. The decisions concerning the level of protection required are made on a case-by-case basis when a Notice of Intent is received.

Leasing Process

Federal oil and gas leasing authority is found in the 1920 Mineral Leasing Act, as amended, for public lands and the 1947 Acquired Lands Leasing Act, as amended, for acquired lands. Leasing of federal oil and gas is affected by other acts such as National Environmental Policy Act of 1969, the Wilderness Act of 1964, National Historic Preservation Act of 1966, the Endangered Species Act of 1973, Federal Land Policy and Management Act of 1976, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. Regulations governing federal oil and gas leasing are contained in 43 CFR Part 3100 with additional requirements and clarification found in Onshore Operating Orders and Washington office manuals, handbooks and instruction memorandums.

The 1920 *Mineral Leasing Act* provides that all public lands are open to oil and gas leasing unless a specific order has been issued to close an area. Leasing procedures for oil, conventional gas, and coal bed natural gas are the same.

The lease grants the right to explore, extract, remove, and dispose of oil and gas deposits that may be found in the leased lands. The lessee may exercise the rights conveyed by the lease subject to the lease terms and attached stipulations, if any.

Lease rights may be subject to lease stipulations and permit approval requirements. Stipulations and permit requirements describe how lease rights are modified. Lease constraints or requirements may also be applied to applications for permit to drill on existing leases provided the constraints or requirements are within the authority reserved by the terms and conditions of the lease. The stipulations and conditions of approval must be in accordance with laws, regulations, and lease terms. The lease stipulations and permit conditions of approval allow for management of federal oil and gas resources in concert with other resources and land uses. The BLM planning process is the mechanism used to evaluate and determine where and how federal oil and gas resources will be made available for leasing. In areas where oil and gas development may conflict with other resources, the areas may be closed to leasing. Areas where oil and gas development could coexist with other land uses or resources will be open to leasing. Leases in these areas will be issued with standard lease terms or with added stipulations based upon decisions in the land use document. Added stipulations are a part of the lease only when environmental and planning records demonstrate the necessity for the stipulations (modifications of the lease).

Currently, leases are issued as either competitive leases or noncompetitive leases with 10-year terms. Competitive leases will be sold to the highest qualified bidder at oral auctions that are held at least quarterly. Tracts that receive no bid at the sale are available for the filing of noncompetitive offers for two years following the sale. All offers filed the day after the sale (referred to as day-after-the-sale filings) are considered simultaneously filed. This means that if there is more than one offer filed for a specific parcel the day after the sale, a drawing must be held to determine the priority on multiple offers. Noncompetitive offers filed after that time are on a first-come first-served basis. If there are no offers filed for a parcel for the two-year period after the sale, the lands must be nominated again for competitive leasing. Rental payments for these leases will be \$1.50 per acre for the first 5 years and \$2.00 per acre thereafter until production is established. If the lessee establishes hydrocarbon production, the leases can be held for as long as oil or gas is produced. The royalty rate for leases issued following the 1987 Oil and Gas Leasing Reform Act is 12-1/2 percent one-half of which is returned to the State of South Dakota on public domain lands (not acquired lands). Minimum royalty is the same amount as the rental. Future interest leases are available for entire or fractional mineral estates that have not reverted to federal ownership. These are minerals that are reserved by the grantor for a specific period of time in warranty deeds to the United States. Any future interest leases may be obtained only through the competitive bidding process and are made effective the date of vesting of the minerals with the United States.

Consultation with tribes is sometimes required during the leasing and the permit to drill processes. This depends on concerns expressed by tribes in relation to Native American traditional and religious values and practices. Refer to the cultural resources section (2.1.14) in Chapter Two of the Analysis of the Management Situation (AMS) for further discussion of this topic (BLM 2010).

Lease Form

Oil and gas leases are issued on Form 3100-11, Offer to Lease and Lease for Oil and Gas (Appendix G.5). Stipulations are attached to this form when resources have been identified for protection or mitigation (Forms MT-3109-2 through 4).

Special Stipulations for Other Surface

Management Agencies: Lands leased for the Bureau of Reclamation, Corps of Engineers, the Department of the Air Force, or other agencies will use special stipulation forms to identify operating requirements on Lands under their jurisdiction. (See Appendices G.8 and G.9)

Resource Management Plan Maintenance

New information may lead to changes in existing resource inventories. New use areas and resource locations may be identified or use areas and resource locations that are no longer valid may be identified. These resources usually cover small areas requiring the same protection or mitigation as identified in this plan. Identification of new areas or removal of old areas that no longer have those resource values will result in the use of the same lease stipulation identified in this plan. These areas will be added to the existing data inventory without a plan amendment. In cases where the changes constitute a change in resource allocation outside the scope of this plan, a plan amendment will be required.

Lease Stipulations

Certain resources in the planning area require protection from impacts associated with oil and gas activities. The specific resource and the method of protection are contained in lease stipulations. Lease stipulations are usually no surface

occupancy, controlled surface use, or timing limitation. A notice may also be included with a lease to provide guidance regarding resources or land uses. While the actual wording of the stipulations may be adjusted at the time of leasing, the protection standards described will be maintained.

Controlled Surface Use

Use or occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational constraints that may modify the lease rights. Controlled surface use is used for operating guidance, not as a substitute for the no surface occupancy or timing stipulations.

No Surface Occupancy (NSO)

Use or occupancy of the land surface for fluid mineral exploration or development is prohibited in order to protect identified resource values. The no surface occupancy stipulation includes stipulations which may have been worded as No Surface Use and Occupancy,” “No Surface Disturbance,” “Conditional No Surface Occupancy,” and “Surface Disturbance or Occupancy Restriction (by location).”

Timing Limitation (Seasonal Restriction)

Prohibits surface use during specified times to protect identified resource values. This stipulation does not apply to the operation and maintenance of production facilities unless the findings of analysis demonstrate the continued need for such mitigation and that less stringent, project-specific mitigation measures will be insufficient.

Waivers, Exceptions, Modifications

Lessees must honor lease stipulations when an Application for Permit to Drill or other surface disturbing operations are proposed to explore and develop a lease, unless the BLM grants a waiver, exception, or modification to a lease stipulation. This RMP establishes the guidelines by which future waivers, exceptions, or modifications are granted within the SDFO. Substantial modification or waiver is subsequent to lease issuance is subject to public review for at least a 30-day period.

Exception: A case-by case exemption from a lease stipulation. The stipulation continues to apply to all other sites within the leasehold to which the restrictive criteria apply.

Modification: Fundamental changes to the provisions of a lease stipulation, either temporarily or for the term of the lease. Therefore, a modification may include an exemption from or alteration to a stipulated requirement. Depending on the specific modification, the stipulation may or may not apply to all other sites within the leasehold to which the restrictive criteria apply.

Waiver: Permanent exemption from a lease stipulation. The stipulation no longer applies anywhere within the leasehold.

Sage-Grouse

Priority will be given to leasing and development of fluid mineral resources, including geothermal, outside of PHMA and GHMA. When analyzing leasing and authorizing development of fluid mineral resources, including geothermal, in PHMA and GHMA, and subject to applicable stipulations for the conservation of Greater Sage-Grouse, priority will be given to development in non-habitat areas first and then in the least suitable habitat for Greater Sage-Grouse. The implementation of these priorities will be subject to valid existing rights and any applicable law or regulation, including, but not limited to, 30 U.S.C. 226(p) and 43 C.F.R. 3162.3-1(h).

Permitting

A federal lessee or operator is governed by procedures set forth in the Code of Federal Regulations at 43 CFR Part 3160, Onshore Oil and Gas Order No. 1, “Approval of Operations on Onshore Federal and Indian Oil and Gas Leases,” issued under 43 Code of Federal Regulations (CFR) 3164 and other orders and notices.

The lessee may conduct lease operations after lease issuance. However, proposed drilling and associated activities must be approved in advance before beginning operations. Therefore, before beginning construction or the drilling of a well,

the lessee or operator must file an Application for Permit to Drill (APD) with the BLM North Dakota Field Office (NDFO). A copy of the application will be posted in the NDFO and South Dakota Field Office (SDFO) for a minimum of 30 days for review by the public. After 30 days, the application can be approved in accordance with (a) lease stipulations, (b) Onshore Oil and Gas Orders, and (c) Onshore Oil and Gas regulations (43 CFR Part 3160) if it is administratively and technically complete.

Evidence of bond coverage for lease operations must be submitted with the application. Bond amount must not be less than a \$10,000.00 lease bond, a \$25,000.00 statewide bond or a \$150,000.00 nationwide bond.

Pre-drill on-site inspections will be conducted for all wells. The inspection makes possible selection of the most feasible well site and access road from environmental, geological, and engineering points of view. The purpose of the field inspection is to evaluate the operator's plan, assess the situation for possible impacts, and to formulate resource protection stipulations. Surface use and reclamation requirements are developed during the on-site inspection that is usually scheduled within 10 days after receipt of the Notice of Staking (NOS) or APD. For operations proposed on privately-owned surface, if the operator after a good-faith effort is unable to reach an agreement with the private surface owner, the operator must post a bond to cover loss of crops and damages to tangible improvements prior to approval of the APD.

Where a proposed fluid mineral development project on an existing lease could adversely affect GRSG populations or habitat, the BLM will work with the lessees, operators, or other project proponents to avoid, reduce and mitigate adverse impacts to the extent compatible with lessees' rights to drill and produce fluid mineral resources. The BLM will work with the lessee, operator, or project proponent in developing an APD for the lease to avoid and minimize impacts to sage-grouse or its habitat and will ensure that the best information about the GRSG and its habitat informs and helps to guide development of such Federal leases.

Normally, site-specific mitigations in the form of conditions of approval are added to the APD for protection of surface and subsurface (including groundwater) resource values in the vicinity of the proposed activity. The BLM is responsible for preparing environmental documentation necessary to satisfy the National Environmental Policy Act (NEPA) requirements and provide any mitigation measures needed to protect the affected resource values.

Conditions of approval implement the lease stipulations and are part of the permit when environmental and field reviews demonstrate the necessity for operating constraints or requirements. A surface restoration plan is part of an approved permit, either an APD or Sundry Notice that includes other surface-disturbing activities.

The authorized officer will act on the application in one of two ways:

Within 30 days after the operator has submitted a complete application including incorporating any changes that resulted from the onsite inspection the BLM will:

- (1) approve the application subject to reasonable conditions of approval if the requirements of the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), Endangered Species Act (ESA), or other applicable law have been completed and, if on FS lands, FS has approved the Surface Use Plan of Operations; or
- (2) notify the operator that it is deferring action on the permit. The notice of deferral must specify:
 - a. any action the operator could take that will enable BLM to issue a final decision on the application. Actions may include but are not limited to; assistance with data gathering or assistance with preparation of analyses and documents;
 - b. and if necessary, a list of actions that BLM needs to take, including completing requirements of NEPA or other applicable law and a schedule for completing these actions.

The operator has 2 years from the date of the notice of deferral to take the action specified in the notice. If all analyses required by NEPA, NHPA, ESA and other applicable laws have been prepared, BLM and with FS concurrence, if appropriate, shall make a decision on the permit within 10 days of receiving a report from the operator addressing all of the issues or actions specified in the deferral notice and certifying that all required actions have been taken. If the operator has not completed the actions specified in the notice, BLM may deny the permit at any time later than 2 years from the operator's receipt of the deferral notice.

For drilling operations on lands with state or private mineral ownership, the lessee must meet the requirements of the mineral owner and the state regulatory agency. The BLM does not have jurisdiction over nonfederal minerals; however, the BLM has surface management responsibility in situations of BLM surface over nonfederal mineral ownership.

When final approval is given by the BLM, the operator may begin construction and drilling operations. Approval of an APD is valid for one year. If construction does not begin within one year, the permit must be reviewed prior to approving another APD.

A Sundry Notice is used to approve other surface and subsurface lease operations. When a well is no longer useful, the well is plugged and the surface reclaimed. A Sundry Notice is also used to approve well plugging and reclamation operations, although verbal approval for plugging may be given for a well that was drilled but not completed for production.

The period of bond liability is terminated after all wells covered by the bond are properly plugged and the surface reclaimed. The lands may then become available for future leasing.

Application for Permit to Drill

Applications for Permit to Drill are approved for the SDFO by the authorized officer at the NDFO. The approved APD includes Conditions of Approval, and Informational Notices that cite the regulatory requirements from the Code of Federal Regulations, Onshore Operating Orders and other guidance.

Conditions of Approval

Conditions of approval are mitigation measures that implement restrictions in light of site-specific conditions. General guidance for conditions of approval and surface operating standards is found in the BLM and USFS brochure entitled “Surface Operating Standards for Oil and Gas Exploration and Development” (USDI BLM 2007a) and BLM Manual 9113 entitled “Roads”.

The BLM commonly applies best management practices when approving APDs. The sources of many of these may be found in Appendix J and on the internet at:

http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices.html

<http://www.blm.gov/bmp/> (a simpler internet address going to the same place)

http://www.blm.gov/mt/st/en/prog/energy/oil_and_gas/operations.html

Description: BMPs for oil and gas demonstrate practical ideas which may eliminate or minimize adverse impacts from oil and gas development to public health and the environment, landowners, and natural resources; enhance the value of natural and landowner resources; and reduce conflict.

The following mitigation measures may be applied to approved permits to drill as conditions of approval. The listing is not all-inclusive, but presents some possible conditions of approval that may be used in the planning area. The wording of the condition of approval may be modified or additional conditions of approval may be developed to address specific conditions.

In addition to the best management practices identified in Appendix J, new BMPs will constantly be developed, and the BLM will also develop site-specific practices on a case-by-case basis as needed.

Surface Conditions

If a tank battery is constructed on this lease, each tank setting, treater, and separator, must be surrounded on all sides by an impermeable berm or dike of sufficient capacity to adequately contain the contents of the largest vessel within it, plus one (1) day's production. All load lines must terminate within the berm or dike, unless there is an adequate box with overflow drain back inside the dike. If a tank battery is constructed for multiple wells, and/or is constructed off of this location, a separate authorization from the BLM will be necessary.

The operator shall immediately notify BLM if unexpected cultural resources are observed and shall avoid operations that will result in the destruction of these resources. Disturbance of such discoveries is not allowed until the operator is directed to proceed by BLM.

All above ground facilities will be painted a flat earthtone color which will blend in with the surrounding environment within 6 months of well completion, unless otherwise approved by BLM. (Color will be selected for the specific site from current color charts.)

Sewage will be disposed of according to county and state requirements, which mandate collecting and holding sewage onsite in portable chemical toilets, with disposal off site, in a municipal facility. Other waste and chemicals may not be disposed of or burned on location.

Store garbage and trash in a dumpster and dispose of it according to county and state regulations. It may not be disposed of or burned on location.

Saltwater or testing tanks will be located and/or diked so any spilled fluids will be contained. Saltwater and diesel tanks will not be placed on topsoil stockpiles.

The operator is responsible for the weed control in the permitted area. A Pesticide Use Proposal must be approved by BLM before spraying is begun. The landowner should also be consulted prior to spraying.

The operator is responsible for locating and protecting existing pipe lines, power lines, and telephone lines.

Save all of the topsoil from the location, stockpile it near the location in an accessible place, and re-use the topsoil to reclaim unused portions of the producing wellsite, or the whole abandoned wellsite, as applicable, after drilling and production testing are completed. Save all the topsoil from the access road, stockpile it along the access road, and re-use the topsoil to reclaim unused portions of the access road, shoulders and ditches, or the whole abandoned access road, as applicable, after drilling and production testing are completed.

A reserve pit liner will be required. The liner must have a burst strength of not less than 140 psi. If the reserve pit is excavated through sand, coal, or rock, the liner must have a burst strength of not less than 200 psi, and the bottom and sides of the pit must be covered with six inches of clay before the liner is installed. No trash will be disposed of in the reserve pit.

A fence may be dispensed with, during drilling as a safety measure, but prior to the location being left unattended when there is liquid in the pit, a fence must be erected around the reserve pit. The reserve pit must remain fenced until closure of the pit is complete, unless the entire location is fenced.

The location and facilities must be fenced for production, or individual pieces of well equipment may be fenced rather than the entire well location. Any fences around the entire location require cattle guards and gates where the road goes through, and must be maintained to keep livestock out until abandonment and reclamation of the well.

If the well is a producer, or permanently abandoned, all site reclamation must be completed within 6 months of the date drilling ceased, unless otherwise approved by BLM. Normally the reclamation will include major items such as: reserve pit reclamation, pit backfill settling, well pad recontouring, amendments such as: manure, straw, hay, wood chips and/or topsoil spreading, and seeding or hydroseeding.

Trenching or breaching of the reserve pit during reclamation is not allowed. In the event of winter freeze-up, reclamation may be put on hold by BLM. Pit fluids which can be separated from cuttings may not be disposed of on location. Separable pit fluids must be reused on another well, disposed of in a disposal well, or otherwise according to state regulations. When the well is abandoned, the operator must contact BLM for development of the final reclamation plan and for approval of the reclamation work. Only BLM can give approval of downhole plugging.

When the well is permanently abandoned: remove the scoria, gravel, or other surfacing from the location, as well as from the road, and reuse or dispose of this surfacing elsewhere.

Reshape the location to natural contours and provide needed water controls to prevent erosion, spread the topsoil and reseed on the contour.

If the well is a producer, the part of the location not needed for production or workover operations must be reclaimed to natural contours and provided with water erosion controls and reseeded.

The following seed mix, is to be used in spring seeding prior to May 30, and fall seeding from Oct. 1 to soil freeze up:

Thickspike Wheatgrass	6 lbs/acre of pure live seed (PLS)
Green Needlegrass	6 lbs/acre of pure live seed (PLS)
<u>Blue Grama</u>	<u>3 lbs/acre of pure live seed (PLS)</u>
Total	15 lbs/acre

If there is a problem with obtaining seed, contact the BLM for a replacement seed mix. Rates of seeding are given in "pure live seed" (PLS). Seed must be drilled on the contour (1/2 to 3/4 inch deep). Seed may be broadcast at double the above rates and then dragged to work it into the soil. The operator must furnish a notice of certified weed free seed to BLM prior to seeding disturbed areas. Fertilize with 30 pounds nitrogen and 40 pounds phosphorus per acre, when seeding. The reclamation will be considered successful when the reclaimed areas have been stabilized and reclaimed to the satisfaction of BLM. After final abandonment, when surface reclamation is complete and vegetation reestablished, any fences shall be removed or the fenced area reduced as required by the BLM. The seed mix and methods used to seed or fertilize may be adjusted by BLM as needed to accommodate differences in conditions at each site. BLM may require sage-brush or other species to be planted on some sites.

The permittee shall take precautions to protect all public land survey monuments, private property corners, and BLM boundary markers. In the event that any such land markers or monuments are destroyed in the exercise of the privileges authorized by this permit, depending on the type of monument destroyed, the permittee shall reestablish or reference the same in accordance with the following: (1) procedures outlined in the "Manual of Instructions for the Survey of the Public Land of the United States," (2) specifications of the county surveyor, or (3) the specifications of the BLM.

Rig stacking will only be allowed with prior approval of the BLM.

Approaches for Development of Oil and Gas Conditions of Approval (COAs) for Concerns not Addressed in Lease Stipulations

Certain activities that are not addressed in lease stipulations may result in surface disturbing or disruptive activities or create impacts to other resources depending on specific conditions at individual well sites. Some examples include operation and maintenance of wells, restricting the use of reserve pits above shallow water tables, use of diesel fuel when drilling, continuous travel to and from well sites and noise associated with these activities.

The following approaches address conditions of Approval (COAs) that may be developed to mitigate impacts commonly associated with oil and gas activities. These examples are not all inclusive; additional COAs will be developed as needed. These approaches may change as a result of new technology, improved science, changes to Best Management Practices, changes in status of special status species, and a host of other factors. Site specific conditions on or near the project site may also result in changes to the COA listed below.

Solutions which may be used to decrease the risk of groundwater pollution from well locations, will be to prevent any long term storage or any release of chemicals from a drilling system on the well site. This can be done with closed mud systems (using tanks rather than any excavated pits) with removal of mud fluids and fluid soaked cuttings from the well site, along with state regulation of the disposal of the materials. If a drying system can be devised with the closed mud system, dried cuttings and possibly even mud constituents could potentially be left on location in a closed and capped storage pit.

Another method of decreasing risk of contaminants is to place an impervious engineered cap over a conventional reserve pit. A slightly domed impermeable cap of the reserve pit, engineered to permit little or no rainwater percolating through the cover and into the pit, as well as engineered to last a very long time, should greatly decrease or even eliminate infiltration, and thus the entrainment and the risk of toxic pit constituents leaving the pit and following a pathway to reach and contaminate groundwater. At this time, current technology will likely necessitate materials like bentonite or high density polyethylene materials as likely candidates to use to attain a low level of permeability of 10^{-7} cm/s.

Encouraging reuse of reserve pit fluids can cut the total amount of wastes which need to be disposed. Identifying the contents of the drilling fluids or formation fracturing fluids and working with oil and gas companies to decrease the

amounts of the more toxic chemicals used will decrease the potential for ground water contamination. Additional monitoring of the fluids used and the amounts used or left in closed pits, or restrictions in the use of excavated pits may be necessary to ensure that risks to ground water are minimized.

Geological Review and Engineering Analysis

The Field Office Geologist reviews the proposed casing program to ensure the surface casing will be placed below all fresh water zones. A Petroleum Engineer reviews the Drilling Plan to ensure the blowout preventer equipment, casing, cementing, and mud programs will provide adequate protection to down hole resources and mitigate any impacts at the surface.

Most wells drilled in the Williston Basin, or its outliers, as well as other basins containing salt formations, use saltwater or a combination of saltwater and oil base fluid (invert) as a drilling fluid. The use of saltwater and oil based mud systems can contaminate fresh water zones or other usable water zones by infiltration or injection. The contamination of fresh water or other usable water resources by drilling or formation fluids will be prevented through the use of casing and Conditions of Approval (COA) to drill. A COA requires that the surface hole be drilled with fresh water and that no salt or materials having toxic effects be used during that part of the operation. After drilling the surface hole, casing (steel pipe) is placed in the hole and cement is circulated to the surface. This casing and cement protects the fresh and usable water zones while completing the drilling operations with salt water or oil based mud. The casing and cement also provide protection during production operations and well control operations.

A COA requires that all reserve pits be lined to prevent or reduce leakage of the pit contents into the surrounding soils or groundwater. Any hazardous materials or substances with toxic effects added to, or held within, the mud system during drilling operations, are contained in the well or on location in a reserve pit. These substances could cause contamination of the surface soils, surface water, and subsurface water resources from spills or in the case of leakage from the reserve pit.

Upon completion of the drilling program, the fluid is required to be removed from the reserve pit and disposed of in a state approved disposal well or used at another drilling well. Any remaining drill cuttings and solid drilling mud constituents, as well as a portion of absorbed fluids are contained within the lined reserve pit. Another COA requires that the liner used in the reserve pit be left in place upon abandonment and that the pit not be trenched.

Closed mud system use may be required, with the use of tanks rather than pits, and with no chemicals, muds, or rock cuttings left on location when drilling is done.

Drilling Operations

To ensure that drilling and completion operations are conducted in a safe and environmentally sound manner, the BLM reviews, and evaluates, approves and regulates all drilling and completion operations, and related surface disturbance associated with Federal and Indian oil and gas mineral development. Operators must submit Applications for Permit to Drill (APDs) to the agency in accordance to Onshore Order #1. Prior to approving an APD, the BLM identifies all potential subsurface formations that will be penetrated by the wellbore. This includes groundwater aquifers and any zones that will present potential safety or health risks that may need special protection measures during drilling, or that may require specific protective well construction measures. All well casing and cementing operations that occur on Federal/Indian lands will be reviewed and approved by BLM and conducted in accordance with the applicable requirements specified in Onshore Oil and Gas Order No. 2 and the American Petroleum Institute (API) standards.

The majority of oil and gas wells in the planning area have traditionally been drilled vertically. Horizontal wells have been drilled for a few years and are increasing. Information on types of wells drilled in South Dakota can be obtained from the South Dakota Department of Environment and Natural Resources (SD DENR) oil and gas at: <http://denr.sd.gov/des/og/oghome.aspx>.

Vertical Drilling

The vertical wells producing in the planning area are completed in a variety of formations for both gas and oil. The most productive completions have been those of the Red River Formations. Vertical well depths in South Dakota range from a depth of fifteen hundred feet in the Butte-Harding county border area to 13,000 feet in northern Harding County. Most producing wells are not deeper than 8600 feet.

Directional and Horizontal

Directional drilling may be used where the drill site cannot be located directly over the drilling target. There are limits to both the degree that the wellbore can be deviated from the vertical and the horizontal distance the well can be drilled away from the well site. Directional drilling can theoretically develop lands near the outer boundary of a lease affected by a NSO stipulation. Directional drilling can theoretically develop lands near the outer boundary of a lease affected by a NSO stipulation. Gas wells in the planning area are not deviated for technical and economic reasons.

Some benefits of directional drilling include the avoidance of sensitive or inaccessible surface features (resulting in greater protection of sensitive environments), and, when multiple wells are drilled from the same vertical wellbore or from the same surface location, a reduction in drilling time and associated waste volumes and emissions.

Recent technological advances in horizontal drilling and hydraulic fracturing, described below, have allowed development of unconventional zones (methane-bearing coal zones, oil or gas bearing shale zones, gas hydrates or “tight gas” in low porosity or low permeability traditional zones) that were once universally considered as uneconomic.

Horizontal drilling is commonly defined as deviating a wellbore at least 80 degrees from the vertical so that the borehole penetrates a productive formation in a manner parallel to the formation. Most horizontal wells are drilled vertically from the surface to several hundred feet above the productive formation. The wellbore is then drilled in a curve ending with well going sideways through the productive formation.

The currently producing horizontal wells in the planning area are producing oil from the Ordovician Red River.

In addition to the benefits listed for directional drilling above, another benefit of horizontal drilling is that it exposes the wellbore to a far greater surface area of hydrocarbon-bearing rock when compared to a typical vertical well. Horizontal wells tend to produce more than vertical wells since there is more reservoir rock exposed. This technology also eliminates the need to drill as many wells, since a horizontal well will be capable of producing the oil and gas from a larger areal extent. While this technology may reduce the overall foot print of an oil or gas field, as a result of having multiple wells (multi-well pad), and possibly production facilities on one well pad, the pad is typically larger in size for drilling and production operations. This reduces the acres of surface disturbance per well. Drilling time may be longer for horizontal wells than for a vertical well drilled to the same producing formation; however, technology and increased experience of the area is decreasing drill time for horizontal wells. The need for more drilling mud volume may also increase water needs, pit size or number of holding tanks on site compared to a vertical well to the same producing formation.

Drilling and completion costs for directional and horizontal wells are typically significantly higher than for conventional vertical boreholes, even when the cost savings associated with reduced need for surface disturbance is considered. Eustes (2003) and Fritz, Horn, and Joshi (1991) identified the following specialized requirements and risk factors unique to horizontal and directional drilling that can affect drilling and completion costs for these types of wells:

- specialized equipment (e.g., mud motors, measurement while drilling tools) and specially trained personnel;
- a larger drilling rig and associated equipment;
- casing and drilling string modifications to address problems associated with ovality and bending stresses;
- increased risk of borehole damage due to unique tectonic stresses;
- lengthened overall drilling time on location because more hole is drilled in S-shaped boreholes and horizontal boreholes compared to vertical wells;
- increased torque and drag on borehole equipment; and,
- lengthened overall drilling time on location compared to vertical wells because of slower penetration rates due to increased torque and drag in directional and horizontal wellbores (however, increased operator and driller experience with horizontal drilling has resulted in decreased drilling times in North Dakota over the past several years).

In addition to increased costs, the risk of losing the well because of geologic or mechanical failures is also greater in directional and, particularly, horizontal boreholes than in conventional vertical boreholes. As a result of these increased costs and risk, operators tend to prefer vertical over directional or horizontal boreholes unless special circumstances exist that make such drilling a necessity or economically attractive. For example, the geology of a reservoir may be such that a vertical borehole may only contact a few feet of the productive horizon, while a horizontal borehole may be able to contact tens to thousands of feet (depending on factors such as how the well is completed and the areal extent of the pool). In a case such as this, the operator must make the determination that the increased potential for productivity outweighs the increased drilling costs and inherent risks involved in directional and horizontal drilling.

Hydraulic Fracturing

Hydraulic fracturing has been utilized by the oil and gas industry since the late 1940's. In South Dakota, nearly all hydraulic fracturing is used on a small scale in vertical wells. Outside the planning area, hydraulic fracturing, in conjunction with horizontal drilling described above, has allowed for development of unconventional zones that were once considered uneconomical, like the Bakken and Three Forks Formations in the Williston Basin area of North Dakota and Montana. The greatest potential use for hydraulic fracturing, in conjunction with horizontal drilling, is likely to be in the Three Forks Formation in South Dakota. However, in time, other formations may be found to be better candidates.

Hydraulic fracturing is a technique used to create additional space and connecting existing fractures and existing rock pores with newly created fractures that are located in deep underground geologic formations. The induced space allows the rock to more readily release oil and natural gas so it can flow to the surface via the well bore that will otherwise be uneconomical to develop. Wells that undergo hydraulic fracturing may be drilled vertically, horizontally, or directionally and the resultant fractures induced by the hydraulic fracturing can be vertical, horizontal, or both. The typical steps of hydraulic fracturing can be described as follows:

1. Water, sand and additives are pumped at high pressures down the wellbore.
2. The liquid goes through perforated sections of the wellbore and into the surrounding formation, fracturing the rock and injecting sand or other proppants into the cracks to hold them open.
3. Experts continuously monitor and gauge pressures along with the volume of fluids and proppants, while studying how the sand reacts when it hits the bottom of the wellbore; slowly increasing the density of sand to water as the frac progresses.
4. This process may be repeated multiple times, in "stages" to reach maximum areas of the wellbore. When this is done, the wellbore is temporarily plugged between each stage to maintain the highest water pressure possible and get maximum fracturing results in the rock.
5. Frac plugs are drilled or removed from the wellbore and the well is tested for results.
6. The water pressure is reduced and fluids are returned up the wellbore for disposal or treatment and re-use, leaving the sand in place to prop open the cracks and allow the oil/gas to flow to the well bore.

Fracturing fluid is typically more than 98 percent water and sand, with small amounts of readily available chemical additives used to carry the proppant and control the chemical and mechanical properties of the water and sand mixture. Proppant, consisting of synthetic or natural silica sand, may be used in quantities of few hundred tons for a vertical well to a few thousand tons for a horizontal well. The amount of water needed to fracture a well in the planning area depends on the geologic basin, the formation, and depth and type of well (vertical, horizontal, directional), and the proposed completion process.

Several sources of water are available for drilling operations and hydraulic fracturing in the planning area. The use of any specific water source on a federally administered well, requires the proposal be reviewed and analyzed through the NEPA process for BLM approval during the APD stage to ensure compliance with state water laws and federal regulations.

Water rights are addressed by the South Dakota Department of Environment and Natural Resources. Any BLM actions will adhere to DENR water quality rules.

Drilling and Completion Costs

The cost of developing conventional deposits of oil and gas in the Rocky Mountain region is higher than the average for the onshore 48 contiguous states (Cleveland 2003). Factors that may contribute to higher costs in the planning area could be:

- changes in rig availability;
- changes in development priority as industry focus on certain plays evolves with new discoveries and changes in oil and gas price;
- harsh environments (particularly cold temperatures); and,
- labor market conditions.

Expenditures for exploration and development in the United States onshore increased 30 percent from 2005 to 29 billion dollars in 2006 (DOE-EIA, 2007b). This was more than three times the average annual expenditure level in the 1990s and the highest amount since 1982. Most of the expenditures in 2006 were for development (\$26 billion).

The National Petroleum Council (2003) reported drilling and completion costs for vertical wells in the Williston and Northern Great Plains region. They reported that the average oil well drilling and completion cost for wells to depths of 5,000 feet was \$280,000. Wells in the 5,000- to 10,000-foot range cost an average of \$955,000 to drill and complete. All cost components such as permitting, location construction, mobilization, rentals and services, tangible items, and stimulations were assumed to be included in these costs.

For gas wells, the National Petroleum Council (2003) reported an average cost for wells to depths of 5,000 feet was \$83,000. Wells in the 5,000- to 10,000-foot range cost an average of \$571,000 to drill and complete. Gas well drilling and completion costs are typically much cheaper than for oil wells in the Williston Basin.

The National Petroleum Council (2003) also reported dry-hole well costs of \$100,000 for average wells to depths of 5,000 feet, and \$506,000 for wells between 5,000 and 10,000 feet deep.

Horizontal well drilling costs are much higher in the Williston Basin. Through June of 2008, EOG Resources, Incorporated has reported an average drilling cost for 72 Bakken Formation horizontal wells of \$5 million per well (North Dakota Bakken Shale Formation News, 2008). Companies are currently using a multi-stage hydraulic fracturing to complete a horizontal borehole. This increases the cost of a well up to \$8 million or more (International Energy Agency, 2012).

Operators in the Rocky Mountain region most of the time have been faced with increases in drilling and completion costs. Drilling rates have generally increased and service costs have also increased. Rig shortages have affected most areas of the region. New planning area wells may be more expensive to equip and operate because of the following factors:

- remoteness and cold temperatures, which often requires dehydrators and line heaters, more expensive types of steel casing, and insulation of surface equipment;
- workovers and preventive maintenance are more frequent, which minimizes shut-in days in the winter when well site access is difficult; and,
- lack of rig availability due to competition for rigs within the Bakken play.

Engineering Conditions of Approval

Some examples of typical Engineering Conditions of Approval are as follows:

All Blowout Prevention Equipment (BOPE) must comply with the minimum requirements of Onshore Oil and Gas Order No. 2 for a 5 M system, including test pressures and frequencies.

Wait-on-cement times must be adequate to achieve a minimum of 500 psi compressive strength. Top-of-cement behind production casing must be above Inyan Kara group.

Gas Flaring: Gas produced from this well may not be vented or flared beyond an initial, authorized test period of 30 days or 50 Mmcft following its completion, whichever first occurs, without the prior, written approval of the authorized officer. Should gas be vented or flared without approval beyond the test period authorized above, you may be directed to shut-in the well until the gas can be captured or approval to continue venting or flaring as uneconomic is granted, and you shall be required to compensate the lessor for that portion of the gas vented or flared without approval which is determined to have been avoidably lost.

A gas analysis, which includes H₂S content, must be made and submitted to this office within three months of completion of this well.

Any unconfined gas that is produced and exceeds 20 ppm H₂S, must be separated and flared. The flare system must include a method of insuring continuous ignition of the gas.

If the concentration of H₂S gas at any point in the facility (i.e.; gas stream, tank vapors, treater, etc.) exceeds 20 ppm, the facility must have a wind-sock placed on the tank battery so that it is visible from everywhere on the location and H₂S warning signs placed at appropriate facilities.

Issuance of Rights-of-Way

Rights-of-way are required for all facilities, tank batteries, pipelines, truck depots, power lines, and access roads that occupy federally managed lands outside the lease or unit boundary. When a third party (other than the operator or the federal government) constructs a facility or installation on or off the lease, a right-of-way is also required.

Informational Notice

The following items comprise the information notice which applies to all federal and Indian minerals wells in North Dakota and South Dakota:

The enclosed Application for Permit to Drill (APD) is approved, subject to the following special conditions. Please be advised that all lease operations are also subject to the terms of the lease, all lease stipulations, and any written instructions or orders of the authorized officer or Surface Management Agency (see attachment to 13 point Surface Use Plan).

It is the sole responsibility of the operator and/or lessee to ensure that all the requirements of Federal Oil and Gas regulations (43 CFR 3100), Notice to Lessees (NTLs), and Federal Onshore Oil and Gas Orders No. 1, 2, 3, 4, 5, 6, and 7 are complied with. Any major deviation from the terms of this APD or Surface Use Plan requires prior approval.

All submitted information not marked "CONFIDENTIAL INFORMATION" will be available for public inspection upon request. (Note: If a submittal is to be held confidential, each page must be so marked.) However, information on Indian Trust Minerals is also held confidential.

Spills, accidents, fires, injuries, blowout and other undesirable events, as described in NTL MSO-1-92, must be reported to this office within the timeframes in NTL MSO-1-92. Furthermore, all spills (saltwater or oil) or pipeline breaks outside the diked area shall be reported within 24 hours to the Surface Management Agency.

Under Environmental Obligations (43 3162.5-1), Disposition of Production (43 CFR 3162.7-1) and Disposal of Produced Water (Onshore Order No. 7):

You are required to take all necessary steps to prevent any death of a migratory bird in pits or open vessels associated with the drilling, testing, completion, or production of this well. The death of any migratory bird found in such a pit or open vessel is a violation of the Migratory Bird Treaty Act and is considered a criminal act. Any deaths of migratory birds attributable to pits or open vessels associated with drilling, testing, completing, or production operations must be reported to this office and the United States Fish and Wildlife Service within 24 hours.

We may require that the pit be designed or the open vessel be covered to deter the entry of birds in any facility associated with drilling, testing, completion, or production of this well. Fencing, screening, and netting of pits may be required as a means to deter bird entry. These conditions will most likely be imposed to prevent the entry of migratory birds if oil is left in pits or open vessels after the cessation of drilling or completion of operations, if water disposal pits consistently receive oil, or if pits or open vessels are used repeatedly for emergency situations which result in accumulation of oil.

Voluntary pit fencing, screening, and netting, or sealing vessels, is encouraged to avoid potential instances that may result in the death of a migratory bird. * For the SD Field Office netting of pits is required.

This APD permit is valid for either two (2) years from the approval date or until lease expiration, whichever occurs first.

You have the right to request a State Director Review of this decision pursuant to 43 CFR 3165.3(b), copy attached. An SDR request, including all supporting documentation, must be filed with the Montana State Office, State Director (MT-920) at P.O. Box 36800, Billings, Montana 59107 within 20 business days of your receipt of this decision. If adversely affected by the State Director's decision, it can be further appealed to the Interior Board of Land Appeals (IBLA) pursuant to 3165.4, 4.411, and 4.413, a copy of each attached. Should you fail to timely request an SDR, or after receiving the State Director's decision, fail to timely file an appeal with the IBLA, no further administrative review of this decision will be possible.

Notification and Report Requirements

A complete copy of the approved (APD), including conditions, stipulations, exhibits, and the H₂S contingency plan (if required) must be on the well site and available for reference during the construction and drilling phases.

The North Dakota Field Office is to be verbally notified of the following actions:

At least 24 hours prior to beginning road and location construction.

Not more than 24 hours after the well is spudded, or on the next regular business day.

At least 24 hours prior to running/cementing surface casing. (This notification may be combined with the spud notice). At least 24 hours prior to drilling 1000' above the Mission Canyon Formation or any H₂S bearing formation, or on next regular business day.

Prior approval for abandonment must be obtained from the Authorized officer. For verbal plugging orders on drilling locations, notify prior to plugging.

BLM representatives can be reached Monday through Friday (7:45 AM - 4:30PM) at the office telephone no. (701) 227- 7700. The BLM personnel can be contacted after hours or on weekends for plugging approvals or any other approvals/change in plans which do not allow for communications during normal office hours by calling the following personnel:

Asst. Field Office Mgr., Minerals
Supr Petroleum Engineer Tech.
Petroleum Engineer
Environmental Protection Specialist
(Also see **Informational Notice**)

Plugging Requirements

All formations bearing usable-quality water, oil, gas, or geothermal resources, and/or a prospectively valuable deposit of minerals shall be protected. Plugging design for an abandonment hole shall include the following:

Open Hole:

- i. A cement plug shall be placed to extend at least 50 feet below the bottom (except as limited by total depth (TD) or plugged back total depth (PBSD)), to 50 feet above the top of:
 - a. Any zone encountered during which contains fluid or gas with a potential to migrate;
 - b. Any prospectively valuable deposit of minerals.
- ii. All cement plugs, except the surface plug, shall have sufficient slurry volume to fill 100 feet of the hole, plus an additional 10 percent of slurry for each 1,000 feet of depth.
- iii. No plug, except the surface plug, shall be less than 25 sacks without receiving specific approval from the authorized officer.
- iv. Extremely thick sections of single formation may be secured by placing 100-foot plugs across the top and bottom of the formation, and in accordance with item ii hereof.
- v. In the absence of productive zones or prospectively valuable deposits of minerals which otherwise require placement of cement plugs, long sections of open hole shall be plugged at least every 3,000 feet. Such plugs shall be placed across in-gauge sections of the hole, unless otherwise approved by the authorized officer.

Cased Hole: A cement plug shall be placed opposite all open perforation and extend to a minimum of 50 feet below (except as limited by TD or PBSD) to 50 feet above the perforated interval. All cement plugs, except the surface plug, shall have sufficient slurry volume to fill 100 feet of hole, plus an additional 10 percent of slurry for each 1,000 feet of depth. In lieu of the cement plug, a bridge plug is acceptable, provided:

- i. The bridge plug is set within 50 feet to 100 feet above the open perforations;
- ii. The perforations are isolated from any open hole below; and
- iii. The bridge plug is capped with 50 feet of cement. If a bailer is used to cap this plug, 35 feet of cement shall be sufficient.

Silica Sand or Silica Flour: Silica sand or silica flour shall be added to cement exposed to bottom hole static temperatures above 230 ° F to prevent heat degradation of the cement.

Mud: Each of the intervals between plugs shall be filled with mud of sufficient density to exert hydrostatic pressure exceeding the greatest formation pressure encountered while drilling such interval. In the absence of other information at the time plugging is approved, a minimum mud weight of 9 pounds per gallon shall be specified.

Wait on cement times must be adequate to achieve a minimum of 500 psi compressive strength. All well pluggings are witnessed by Petroleum Engineering Technicians.

Hazardous Materials

Plugging and acceptance of abandonment of a well does not absolve a company of liability for hazardous materials.

Paleontological/Cultural Stipulations

The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological materials which are uncovered during construction. The operator is to immediately stop work that might further disturb such materials, and contact the authorized officer (AO). Within five working days the AO will inform the operator as to:

- whether the materials appear eligible for the National Register of Historic Places;
- the mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and,
- a timeframe for the AO to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and the mitigation is appropriate.

If the operator wishes, at any time, to relocate activities to avoid the expense of mitigation and/or the delays associated with the process, the AO will assume responsibility for whatever recordation and stabilization of the exposed materials may be required. Otherwise, the operator will be responsible for mitigation costs. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the operator will then be allowed to resume construction.

Construction

Construction of the access road and the well site is necessary before drilling operations begin. The extent of surface disturbance necessary for construction depends on the terrain, depth of the well, drill rig size, circulating system, and safety standards.

The depth of the drill test determines the size of drill rig needed, and therefore, the size of the work area necessary, the need for all-weather roads, water requirements, and other needs. The terrain influences the construction problems and the amount of surface area to be disturbed. Reserve pit size may vary because of well depth, drill rig size, or circulating system.

Access roads to well sites in the planning area usually consist of running surfaces 14 to 24 feet wide that are ditched on one or both sides. Many of the roads constructed will follow existing roads or trails. New roads might be necessary because existing roads are not at an acceptable standard. For example, a road may be too steep so that realignment is necessary.

Roads can be permanent or temporary, depending on the success of the well. The initial construction can be for a temporary road; however, it is designed so that it can become permanent if the well produces. Not all temporary roads

constructed are immediately rehabilitated when the drilling stops. A temporary road is often used as access to other drill sites. The main roads and temporary roads require graveling to be maintained as all-weather roads. This is especially important in the spring. Access roads may be required to cross public lands to a well site located on private or state lands. The portion of the access road on public land will require a BLM right-of-way.

The amount of level surface required for safely assembling and operating a drilling rig varies with the type of rig, but averages 300 feet by 400 feet. Approximately 3-1/2 acres will be impacted by well site construction. The area is cleared of large vegetation, boulders, or debris. Then the topsoil is removed and saved for reclamation. A level area is then constructed for the well site, which includes the reserve pit. Bulldozers and motor scrapers are typically used to construct the well pad. The well pad is flat (to accommodate the drill rig and support equipment) and large enough to store all the equipment and supplies without restricting safe work areas. The drill rig must be placed on “cut” material rather than on “fill” material to provide a stable foundation for the rig. The degree of cutting and filling depends on terrain; that is, the flatter the site, the less dirt work is required.

Hillside locations are common, and the amount of dirt work varies with the steepness. A typical well pad will require a cut 10 feet deep against the hill and a fill 8 feet high on the outside. It is normal to have more cut than fill to allow for compaction, and any excess material is then stockpiled. Eventually, when the well is plugged and abandoned, excavated material is put back in its original place.

Reserve pits are normally constructed on the well pad. Usually the reserve pit is excavated in “cut” material on the well pad. The reserve pit is designed to hold water, drill cuttings, and used drilling fluids. Generally, reserve pits are rectangular in shape and 8 to 12 feet deep, however, the size and number of pits depends on the depth of the well, circulating system and anticipated down hole problems, such as excess water flows. The reserve pit can be lined with a synthetic liner to contain pit contents and reduce pit seepage. BLM normally requires a synthetic liner.

If the well is a producer, casing is set and cemented in place.

Directional drilling may be used where the drill site cannot be located directly over the drilling target. There are limits to both the degree that the well bore can be deviated from the vertical and the horizontal distance the well can be drilled away from the well site.

Horizontal wells are drilled similarly to directional wells, except that the bottomhole location of the well is not a single point, but rather a lateral horizontal section. They are drilled to increase the recovery of oil and gas reserves from vertically fractured reservoirs, or reservoirs with directional permeability.

Environment and Safety

During drilling and production operations for any well the BLM will enforce the provisions of the regulations, Onshore Oil and Gas Operating Orders, and Notice to Lessees NTL-MSO-1-92, Report of Undesirable Events, to ensure operations are carried in a manner that protects the mineral resources, other natural resources, and environmental quality. Regulations at 43 CFR § 3162.5 require that the operator exercise due care and diligence to assure that leasehold operations do not result in undue damage to surface or subsurface resources or surface improvements. All produced water must be disposed of by methods approved by the BLM. Upon completion of operations the operator shall reclaim the surface in a manner approved of by the BLM. All spills or leakages of oil, gas, produced water, toxic liquids, blowouts, fires, personal injuries, and fatalities must be reported by the operator. The operator is required to exercise care in taking measures approved by the BLM to control and remove pollutants and extinguish fires. An operator's compliance with the regulations at 43 CFR § 3162.5 does not relieve him of the obligation to comply with any other law or regulations. Finally, the regulations authorize the BLM to require an operator to file a contingency plan describing procedures to be implemented to protect life, property, and the environment.

Production and Development

Production

Production begins when a well yields oil or gas in commercial quantities. If formation pressure is sufficient to raise oil to the surface, the well is completed as a flowing well. A pumping unit is installed if the formation pressure is not sufficient to bring the oil to the surface. When the well is completed as a free-flowing well, an assembly of valves and special connections known as a “Christmas tree” (so called because of its many branch like fittings) is installed on top of the

casing to regulate the flow of the well. Later, when the natural pressure declines, the Christmas tree can give way to a simple wellhead arrangement of valves and a pumping unit to lift the oil artificially. Many pumping units are “beam” style pumps that are powered by electric motors or gasoline engines. Most gas wells produce by natural flow and do not require pumping. Surface facilities at a flowing well are usually in a small area containing a gas well Christmas tree, a dehydrator, a produced water pit, and a meter house. Separators, condensate tanks, and compressors may be included. Some gas wells require continuous water pumping as water entering the well chokes off the gas flow.

Development

New field development may be analyzed under NEPA by means of an environmental assessment (EA) or environmental impact statement (EIS). The operator should then have an idea of the extent of drilling and disturbance required to extract and produce the oil and gas. When an oil or gas discovery is made, a well spacing pattern must be established before development drilling begins. Development can take years and include from one or two wells to more than a hundred wells per field. Roads to producing wells are upgraded to all-weather roads as necessary. Pipelines, electrical transmission lines, separators, dehydrators, sump pits, and compressor stations soon follow. Sometimes oil and gas processing facilities are built in or adjacent to the field.

Further Seismic Testing

More detailed seismic work can be done to achieve better definition of the petroleum reservoir. Diagonal seismic lines can be required to tie the previous seismic work to the discovery well. The discovery well can be used to conduct studies to correct the previous seismic work and provide more accurate subsurface data.

Spacing Requirements

A well spacing pattern must be established before development drilling begins. Information considered in establishment of a spacing pattern includes data from the discovery well on porosity, permeability, pressure, composition, and depth of formations in the reservoir; well production rates and type (predominantly oil or gas); and the economic effect of the proposed spacing on recovery. The state of South Dakota establishes well spacing patterns for both exploratory and development wells which the BLM generally adopts. The state specifies the minimum distance from lease lines or government survey lines for the bottom-hole location of the well bore depending upon depth of the well. The spacing regulations determine the acres assigned to each well. Spacing unit size is established to provide for the most efficient and economic recovery of oil or gas from a reservoir. Normal well spacing ranges from 40 acres to 1280 acres. Wells deeper than 11,000 feet can be no closer than 1,650 feet to other producing wells below 11,000 feet. Only one producing well per formation is allowed in each 40, 80, 160, 320, 640, and 1280 acre unit.

Drilling of Development Wells

The procedures used in drilling development wells are the same as those used for wildcat wells, but usually with less subsurface sampling, testing, and evaluation. The rate at which development wells are drilled in a field depends on factors such as whether the field is developed on a lease basis or unitized basis, the probability of profitable production, the availability of drilling equipment, lease requirements, and the degree to which limits of the field are known. Some fields go through several development phases, the first resulting from the original discovery and others from later discovery. A field can be considered fully developed and produce for several years, and then a well may be drilled to a deeper or shallower pay zone. Discovery of a new pay zone in an existing field is a “pool” discovery (as distinguished from a new field discovery). A pool discovery may lead to the drilling of additional wells, often from the same drilling pad as existing wells.

Inspections

Geophysical operations and lease operations are inspected to determine compliance with approved permits, to resolve conflicts or correct problems and to determine effectiveness and need of lease stipulations. All inspections are documented. Operators are required to correct problems or violations.

Surface Requirements

Field development activities that cause surface disturbance include access roads, well sites, production facility sites, flow line and utility line routes and waste disposal sites. Surface uses in a gas field will be less than in an oil field, because gas wells are usually drilled on larger spacing units. The spacing pattern of 640 acres per well, which is common in gas

fields, will require only one well per section and might require only ½ mile of access roads and pipelines. Production facilities include separation and storage equipment. Separation equipment is required when production includes a combination of oil, gas, or water and storage equipment is required for holding liquids prior to sales.

Flow Lines

Oil and gas are transferred from the well to storage facilities through small diameter (<6 inches) flow lines. Flow lines can be on the surface, buried or elevated. Produced water, gas, or polymerized liquid is transferred from storage facilities to injection wells for secondary recovery.

Separating, Treating, and Storage

Any water or gas associated with produced oil is separated from the oil before it is placed in storage tanks. The treating facilities are located at a storage tank battery. Low-pressure petroleum that must be pumped from the well is treated in a single separation. High pressure, flowing petroleum can require several stages of separation, with a pressure reduction accompanying each stage.

Produced gas is sold when there is sufficient volume, necessary transportation, a market, and it is economical. Generally, if the volume of produced gas is too low for sales, it is used as fuel for well pump engines and heating fuel for the treaters. If the volume of produced gas exceeds fuel requirements on the lease but gas sales are not possible, the gas can be flared or vented into the atmosphere when authorized by permit in accordance with state and federal regulations. When water is produced with the hydrocarbons, it is separated before the gas is removed. In primary operations, where natural pressures or gravity causes the petroleum in the reservoir to flow to the wellbores, the degree of mixing is high enough to require chemical and heat treatment to separate the oil and water. In secondary production, where water injection or other methods are used to force additional petroleum to the wellbore, the oil and water often are not highly emulsified. In this case, the oil and water can be separated by gravity in a tall settling tank. Produced water can be disposed of by injection into the subsurface, surface evaporation or beneficial purposes such as water for livestock or irrigation.

Produced water from oil and gas operations is normally disposed of by subsurface injection or in surface pits. Regardless of the method of disposal, it must be acceptable to the BLM, in accordance with the requirements of Onshore Oil and Gas Order No. 7, titled "Disposal of Produced Water." Disposal of produced water by injection wells requires permits from the South Dakota Department of Environment and Natural Resources. When produced water is disposed underground, it is introduced or injected under pressure into a subsurface horizon containing water of equal or poorer quality. Produced water may be injected into the producing zone from which it originated to stimulate oil production. Dry holes or depleted wells are commonly converted for saltwater disposal and occasionally new wells are drilled for this purpose. The law and regulations require that all injection wells be permitted under the Underground Injection Control program.

Under the Underground Injection Control approval process, the disposal well must be pressure tested to ensure the integrity of the casing. The disposal zone must also be isolated by use of tubing and mechanical plug called a packer. The packer seals off the inside of the casing and only allows the injected water to enter the disposal zone. The tubing and packer are also pressure tested to ensure their integrity. These pressure tests confirm isolation of the disposal zone from possible usable water zones. The oil is transported to storage tanks through flow lines after separation from any water or gas. Storage tanks are usually located on the lease either at the producing well or at a central production facility. The number and size of tanks are dependent upon the type and amount of production on the lease.

Abandonment

When drilling wells are unsuccessful or production wells are no longer useful, the well is plugged, equipment is removed from the well site or production facility site, and the site is abandoned. The well bore is secured by placing cement plugs to isolate hydrocarbon-producing formations from contaminating other mineral or water bearing formations. The site and roads are then restored as near as possible to original contours. Topsoil is replaced and the recontoured areas are seeded. Reclamation of access roads and well sites on privately owned surface is completed according to the surface owner's requirements.

Rehabilitation requirements generally are made a part of the Application for Permit to Drill. Upon completion of abandonment and rehabilitation operations, the lessee or operator notifies the SDFO, via the NDFO that the location is

ready for inspection. Final abandonment will not be approved until the required surface reclamation work has been completed to the satisfaction of the BLM or surface owner. The period of bond liability for the well site is terminated after approval of final abandonment. Reclamation of the reserve pit is part of the well site reclamation process. Reserve pit reclamation includes removal of fluids to a disposal well or commercial pit and burial of solids in the pit. Solids should not be buried until dry and then covered with a minimum of 6 feet of native soil. Any pit liner may be buried in place. Methods such as solidification or dewatering may be used to help dry the solids.

Regulations, Laws, and Special Procedures

Unit and Communitization Agreements

Unit and communitization agreements can be formed in the interest of conservation and to allow for the orderly development of oil and gas reserves. A unit agreement provides for the recovery of oil and gas from the lands as a single consolidated entity without regard to separate lease ownerships. An exploratory unit is used for the discovery and development of the field in an orderly and efficient manner. Paying and nonpaying well determinations are made for each well drilled. If the well is nonpaying as defined by the agreement, the production is allocated on a lease basis. If the well is a paying unit well, a participating area is formed and the production is allocated to all interest owners in the participating area based on surface area. A secondary unit is formed after the field has been defined and enhanced recovery techniques are being utilized. Secondary recovery techniques include water injection, natural gas injection, or carbon dioxide injection. Injection is initiated to maintain the reservoir pressure to maintain oil production. The agreement provides for the allocation of production among all the interest owners.

A communitization agreement combines two or more leases (federal, state, or fee) that otherwise could not be independently developed in conformity with established well spacing patterns. The leases within the spacing unit share in the costs and benefits of the well drilled in the spacing unit. Therefore, unit and communitization agreements can lessen the amount of damage to the environment and save dollars by eliminating unnecessary wells, roads, pipelines, and lease equipment.

Split Estate

Part of the area included in the planning area contains lands known as split estate lands. These are lands where the surface ownership is different from the mineral ownership. Management of federal oil and gas resources on these lands is somewhat different from management on lands where both surface and mineral ownership is federal. On split estate lands where the surface ownership is private, the BLM places necessary restrictions and requirements on its leases and permit approvals and works in cooperation with the surface owner. BLM has established policies for the management of federal oil and gas resources in accordance with federal laws and regulations.

The BLM does not have the legal authority to regulate how private surface is managed. BLM does have the statutory authority to require measures by lessees to avoid or minimize adverse impacts that may result from federally authorized mineral lease activities. These measures, in the form of lease stipulations or permit conditions of approval, are intended to protect or preserve the privately owned resources and prevent adverse impacts to adjoining lands, not to dictate management to the surface owner. The term split estate can also refer to lands where the surface ownership is federal and the mineral ownership is private. In this situation, BLM is the surface owner, and works in cooperation with the proponent and the state regulatory agency that approves private mineral applications. BLM has responsibilities in this situation under the previously mentioned statutes; however, BLM does not have the authority to approve or disapprove the mineral owner's actions. The mineral estate owner usually has the right to enter the land and use the surface that is necessary and reasonable for mineral development through either a reserved or an outstanding right contained in the deed.

Appendix G.7

Guidance and Examples for Oil and Gas Conditions of Approval (COAs)

Certain activities that are not addressed in lease stipulations may result in surface-disturbing or disruptive activities or create impacts to other resources depending on specific conditions at individual well sites. Some examples include operation and maintenance of wells, restricting the use of reserve pits above shallow water tables, use of diesel fuel and other constituents when drilling, continuous travel to and from well sites and noise associated with these activities.

The following approaches address Conditions of Approval (COAs) that may be developed to mitigate impacts commonly associated with oil and gas activities. These examples are not all inclusive; additional COAs will be developed as needed. These approaches may change as a result of new technology, improved science, changes to Best Management Practices, changes in status of special status species, and a host of other factors. Site-specific conditions on or near the project site may also result in changes to the COA listed below.

- Restricting the use of reserve pits over shallow water tables
- Reserve pits and use of diesel fuel and other constituents
- Operation and Maintenance activities and wildlife timing limit stipulations
- Noise disturbance to sharp-tails and sage grouse or other wildlife.

Appendix G.8

U.S. Army Corps of Engineers Oil and Gas Lease Stipulations

The following "form", 3109-2, is not the actual form, but has all the same content as the form. The actual form may be obtained from the BLM.

Form 3109-2
(December 1970)
(formerly 3103-3)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

STIPULATION FOR LANDS UNDER JURISDICTION
OF DEPARTMENT OF THE ARMY,
CORPS OF ENGINEERS

Serial Number

Name of Project

The lands embraced in this lease issued under the Mineral Leasing Act of February 25, 1920 (41 Stat. 437; 30 U.S.C. 181 *et seq.*), as amended, or the Mineral Leasing Act for Acquired Lands of August 7, 1947 (61 Stat. 913; 30 U.S.C. 351 *et seq.*) being under the jurisdiction of the Department of the Army, Corps of Engineers, the lessee hereby agrees:

- (1) That *all* rights under this lease are subordinate to the rights of the United States to flood and submerge the lands, permanently or intermittently, in connection with the operation and maintenance of the above named project.
- (2) That the United States shall *not* be responsible for damages to property or injuries to persons which may arise from or be incident to the use and occupation of the said premises, or for damages to the property of the lessee, or for injuries to the person of the lessee (if an individual), or for damages to the property or injuries to the person of the lessee's officers, agents, servants, or employees, or others who may be on said premises at their invitation or the invitation of any one of them arising from or incident to the flooding of the said premises by the Government or flooding from any other cause, or arising from or incident to any other governmental activities; and the lessee shall hold the United States harmless from any and all such claims.
- (3) That the work performed by the lessee on the lands shall be under the general supervision of the District Engineer, Corps of Engineers, in direct charge of the project, and subject to such conditions and regulation as may be prescribed by him, and the plans and location for all structures, appurtenances thereto, and work on said lands shall be submitted to the said District Engineer for approval, in advance, of commencement of any work on said lands. The District Engineer shall have the right to enter on the premises, at any time, to inspect both the installation and operational activities of the lessee.
- (4) That no structure or appurtenance thereto shall be of a material or construction determined to create floatable debris.

- (5) That the construction and operation of said structures and appurtenances thereto shall be of such a nature as not to cause pollution of the soils and the waters of the project.
- (6) That the United States reserves the right to use the land jointly with the lessee in connection with the construction, operation, and maintenance of the Government project and to place improvements thereon or to remove materials therefrom, including sand and gravel and other construction material, as may be necessary in connection with such work, and the lessee shall not interfere, in any manner, with such work or do any act which may increase the cost of performing such work. If the cost of the work performed by the Government at and in connection with the project, including work performed on lands outside the property included in the lease, is made more expensive by reason of improvements constructed on the leased property by the lessee, the lessee shall pay to the United States money in an amount, as estimated by the Chief of Engineers, sufficient to compensate for the additional expense involved.

Signature of Lessee

Please Note: The following stipulations were developed by the US Corps of Engineers (COE) for use in oil and gas leases on COE lands along Lake Sakakawea in North Dakota. If any oil and gas parcels are processed for leasing in South Dakota, these stipulations will be modified by the COE for the same purpose on COE lands in South Dakota.

Garrison Dam/lake Sakakawea Project, North Dakota Bureau of Land Management Federal Mineral Lease Stipulations

- a. No surface occupancy shall be allowed on those lands below elevation 1855 feet msl (mean sea level) or within 300 feet horizontally from said elevation.
- b. All mineral exploration and production infrastructure shall have a minimum setback of twelve-hundred (1,200) feet from any Tribal, Federal, State, County or private infrastructure. This includes but is not limited to; levees, dams, intakes and buildings.
- c. No surface occupancy shall be allowed on islands located within the flood control pool for Lake Sakakawea, regardless of their elevation.
- d. There are numerous archaeological (cultural and historical) sites on project lands. No surface occupancy will be allowed within a minimum of one-hundred (100) feet of any identified cultural resource site. However, case by case review shall be coordinated through the Riverdale Office Staff Archaeologist located at the Corps of Engineers Project Office in Riverdale, North Dakota, to determine adequate protection.
- e. All lease areas shall be cleared for Threatened and Endangered Species Usage. If any such usage has been documented in the immediate area, mineral exploration activities shall be conditioned in coordination with the Missouri River Recovery Program coordinator located at the Corps of Engineers Project Office in Riverdale, North Dakota.
- f. On those lands, which consist of highly erodible soils, any surface disturbances shall be kept to a minimum. The use of proper engineering practices shall be used to minimize potential soil erosion.
- g. Road construction in association with mineral exploration will be conducted in a manner as primitive as possible, and will be constructed using best engineering practices to minimize surface disturbance.
- h. All fill material required for the exploration or production phase shall be clear of all invasive or noxious weed seeds. Obtaining fill materials from project lands is prohibited.

- i. Any current interior or boundary fence that is located within the lease area shall be maintained, or possibly replaced, to prevent livestock and/or general public from entering the site for their safety.
- j. No surface occupancy will be allowed within twelve-hundred (1,200) feet of any leased or Corps managed recreation or zoned limited development area.
- k. Exploration activities that extend beneath the flood control pool of Lake Sakakawea (1854 feet msl) will require Regulatory review in accordance with Section 10/404 authorities (Rivers and Harbors Act and Clean Waters Act respectively).

Required Stipulations in Mineral Leases on Army-Controlled Real Property

CORPS OF ENGINEERS STIPULATION

1. The Secretary of the Army or designee reserves the right to require cessation of operations if a national emergency arises or if the Army needs the leased property for a mission incompatible with lease operations. On approval from higher authority, the commander will give the lessee written notice or, if time permits, request BLM to give notice of the required suspension. The lessee agrees to this condition and waives compensation for its exercise.
2. If the commander or the commander's authorized representative discovers an imminent danger to safety or security which allows no time to consult BLM, that person may order such activities stopped immediately. The state BLM Director will be notified immediately, will review the order, and will determine the need for further remedial action.
3. If contamination is found in the operating area, the operator will immediately stop work and ask the commander or commander's representative for help.
4. Lessee liability for damage to improvements shall include improvements of the Department of Defense.
5. Before beginning to drill, the lessee must consult with third parties authorized to use real estate in the leased area and must consider programs for which third parties have contractual responsibility.
6. A license to conduct geophysical test on the leased area must be obtained separately from the installation commander or the District Commander.
7. Civil works only: conditions in BLM Form 3109-2, Stipulation for Lands Under Jurisdiction of Department of the Army Corps of Engineers, or successor form.

Appendix G.9

Bureau of Reclamation Oil and Gas Lease Stipulations

Oil and gas lease stipulations for Bureau of Reclamation properties and facilities are shown on the following:

Form 3109-1
(December 1972)
(formerly 3103-1)

United States
Department of the Interior
Bureau of Land Management
LEASE STIPULATIONS
BUREAU OF RECLAMATION

Serial Number _____

The lessee agrees to maintain, if required by the lessor during the period of this lease, including any extension thereof, an additional bond with qualified sureties in such sum as the lessor, if it considers that the bond required under Section 2(a) is insufficient, may at any time require:

- (a) to pay for damages sustained by any reclamation homestead entryman to his crops or improvements caused by drilling or other operations of the lessee, such damages to include the reimbursement of the entryman by the lessee, when he uses or occupies the land of any homestead entryman, for all construction and operation and maintenance charges becoming due during such use or occupation upon any portion of the land so used and occupied;
- (b) to pay any damage caused to any reclamation project or water supply thereof by the lessee's failure to comply fully with the requirements of this lease; and
- (c) to recompense any nonmineral applicant, entryman, purchaser under the Act of May 16, 1930 (46 Stat. 367), or patentee for all damages to crops or to tangible improvements caused by drilling or other prospecting operation, where any of the lands covered by this lease are embraced in any nonmineral application, entry, or patent under rights initiated prior to the date of this lease, with a reservation of the oil deposits, to the United States pursuant to the Act of July 17, 1914 (38 Stat. 509).

As to any lands covered by this lease within the area of any Government reclamation project, or in proximity thereto, the lessee shall take such precautions as required by the irrigation under such project or to the water supply thereof; *provided* that drilling is prohibited on any constructed works or right-of-way of the Bureau of Reclamation, and *provided, further*, that there is reserved to the lessor, its successors and assigns, the superior and prior right at all times to construct, operate, and maintain dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures, and reclamation works, in which construction, operation, and maintenance, the lessor, its successors and assigns, shall have the right to use any or all of the lands herein described without making compensation therefor, and shall not be responsible for any damage from the presence of water thereon or on account of ordinary, extraordinary, unexpected, or unprecedented floods. That nothing shall be done under this lease to increase the cost of, or interfere in any manner with, the construction, operation, and maintenance of such works. It is agreed by the lessee that, if the construction of any or all of said dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone or telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures or reclamation works across, over, or upon said lands should be made more expensive by reason of the existence of the improvements and workings of the lessee thereon, said additional expense is to be estimated by the Secretary of the Interior, whose estimate is to be final and binding upon the parties hereto, and that within thirty (30) days after demand is made upon the lessee for payment of any such sums, the lessee will make payment thereof to the

United States, or its successors, constructing such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, appurtenant irrigation structures, or reclamation works, across, over, or upon said lands; *provided, however*, that subject to advance written approval by the United States, the location and course of any improvements or works and appurtenances may be changed by the lessee; *provided, further*, that the reservations, agreements, and conditions contained in the within lease shall be and remain applicable notwithstanding any change in the location or course of said improvements or works of lessee. The lessee further agrees that the United States, its officers, agents, and employees, and its successors and assigns shall not be held liable for any damage to the improvements or workings of the lessee resulting from the construction, operation, and maintenance of any of the works hereinabove enumerated. Nothing in this paragraph shall be construed as in any manner limiting other reservations in favor of the United States contained in this lease.

THE LESSEE FURTHER AGREES That there is reserved to the lessor, its successors and assigns, the prior right to use any of the lands herein leased, to construct, operate, and maintain dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures, and also the right to remove construction materials therefrom, without any payment made by the lessor or its successors for such right, with the agreement on the part of the lessee that if the construction of any or all of such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures across, over, or upon said lands or the removal of construction materials therefrom, should be made more expensive by reason of the existence of improvements or workings of the lessee thereon, such additional expense is to be estimated by the Secretary of the Interior, whose estimate is to be final and binding upon the parties hereto, and that within thirty (30) days after demand is made upon the lessee for payment of any such sums, the lessee will make payment thereof to the United States or its successors constructing such dams, dikes, reservoirs, canals, wasteways, laterals, ditches, telephone and telegraph lines, electric transmission lines, roadways, or appurtenant irrigation structures across, over, or upon said lands or removing construction materials therefrom. The lessee further agrees that the lessor, its officers, agents, and employees and its successors and assigns shall not be held liable for any damage to the improvements or workings of the lessee resulting from the construction, operation, and maintenance of any of the works herein above enumerated. Nothing contained in this paragraph shall be construed as in any manner limiting other reservations in favor of the lessor contained in this lease.

To insure against the contamination of the waters of the _____ Reservoir,
_____, the lessee agrees that
the following further conditions shall apply to all drilling and operations on lands covered by this lease,
which lie within the flowage or drainage area of the _____ Reservoir, as such area
is defined by the Bureau of Reclamation:

1. The drilling sites for any and all wells shall be approved by the Superintendent,
Bureau of Reclamation, _____ Project, _____ before
drilling begins. Sites for the construction of pipe-line rights-of-way or other authorized facilities shall also
be approved by the Superintendent before construction begins.

2. All drilling or operation methods or equipment shall, before their employment,
be inspected and approved by the Superintendent of the _____ Project,
_____, and by the supervisor of the U.S. Geological Survey having jurisdiction over the area.

GPO 854-703

GP-135
Revised (03/2010)

SPECIAL STIPULATION - BUREAU OF RECLAMATION

To avoid interference with recreation development and/or impacts to fish and wildlife habitat and to assist in preventing damage to any Bureau of Reclamation dams, reservoirs, canals, ditches, laterals, tunnels, and related facilities, and contamination of the water supply therein, the lessee agrees that the following conditions shall apply to all exploration and developmental activities and other operation of the works thereafter on lands covered by this lease:

1. Prior to commencement of any surface-disturbing work including drilling, access road work, and well location construction, a surface use and operations plan will be filed with the appropriate officials. A copy of this plan will be furnished to the Regional Director, Great Plains Region, Bureau of Reclamation, P.O. Box 36900, Billings, MT 59107- 6900, for review and consent prior to approval of the plan. Such approval will be conditioned on reasonable requirements needed to prevent soil erosion, water pollution, and unnecessary damages to the surface vegetation and other resources, including cultural resources, of the United States, its lessees, permittees, or licensees, and to provide for the restoration of the land surface and vegetation. The plan shall contain provisions as the Bureau of Reclamation may deem necessary to maintain proper management of the water, recreation, lands structures, and resources, including cultural resources, within the prospecting, drilling, or construction area.

Drilling sites for all wells and associated investigations such as seismograph work shall be included in the above-mentioned surface use and operation plan.

If later explorations require departure from or additions to the approved plan, these revisions or amendments, together with a justification statement for proposed revisions, will be submitted for approval to the Regional Director, Great Plains Region, Bureau of Reclamation, or his/her authorized representative.

Any operations conducted in advance of approval of an original, revised, or amended prospecting plan, or which are not in accordance with an approved plan constitute a violation of the terms of this lease. The Bureau of Reclamation reserves the right to close down operations until such corrective action, as is deemed necessary, is taken by the lessee.

2. No occupancy of the surface of the following excluded areas is authorized by this lease. It is understood and agreed that the use of these areas for Bureau of Reclamation purposes is superior to any other use. The following restrictions apply only to mineral tracts located within the boundary of a Bureau of Reclamation project, where the United States owns 100 percent of the fee mineral interest in said tract, or tracts.

- a. Within 500 feet on either side of the centerline of any and all roads or highways within the leased area.
- b. Within 200 feet on either side of the centerline of any and all trails within the leased area.
- c. Within 500 feet of the normal high-water line of any and all live streams in the leased area.
- d. Within 400 feet of any and all recreation developments within the leased area.
- e. Within 400 feet of any improvements either owned, permitted, leased, or otherwise authorized by the Bureau of Reclamation within the leased area.
- f. Within 200 feet of established crop fields, food plots, and tree/shrub plantings within the leased area.
- g. Within 200 feet of slopes steeper than a 2:1 gradient within the leased area.
- h. Within established rights-of-way of canals, laterals, and drainage ditches within the leased area.
- i. Within a minimum of 500 feet horizontal from the centerline of the facility or 50 feet from the outside toe of the canal, lateral, or drain embankment, whichever distance is greater, for irrigation facilities without clearly marked rights- of-way within the leased area.

3. No occupancy of the surface or surface drilling will be allowed in the following areas. In addition, no directional drilling will be allowed that will intersect the subsurface zones delineated by a vertical plane in these areas. The following restrictions apply only to mineral tracts, located within the boundary of a Bureau of Reclamation project, where the United States owns 100 percent of the fee mineral interest in said tract, or tracts.

- a. Within 1,000 feet of the maximum water surface, as defined in the Standard Operating Procedures (SOP), of any reservoirs and related facilities located within the leased area.
- b. Within 2,000 feet of dam embankments and appurtenance structures such as spillway structures, outlet
- c. Within one-half (1/2) mile horizontal from the centerline of any tunnel within the leased area.

4. The distances stated in items 2 and 3 above are intended to be general indicators only. The Bureau of Reclamation reserves the right to revise the distances as needed to protect Bureau of Reclamation facilities.

5. The use of explosives in any manner shall be so controlled that the works and facilities of the United States, its successors and assigns, will in no way be endangered or damaged. In this connection, an explosives use plan shall be submitted to and approved by the Regional Director, Great Plains Region, Bureau of Reclamation, or his/her authorized representative.

6. The lessee shall be liable for all damage to the property of the United States, its successors or assigns, resulting from the exploration, development, or operation of the works contemplated by this lease, and shall further hold the United States, its successors or assigns, and its officers, agents, and employees, harmless from all claims of third parties for injury or damage sustained or in any way resulting from the exercise of the rights and privileges conferred by the lease.

7. The lessee shall be liable for all damages to crops or improvements of any entryman, non-mineral applicant, or patentee, their successors or assigns, caused by or resulting from the drilling or other operations of the lessee, including reimbursement of any entryman or patentee, their successors or assigns, for all construction, operation, and maintenance charges becoming due on any portion of their said lands damaged as a result of the drilling or other operation of the lessee.

8. In addition to any other bond required under the provisions of this lease, the lessee shall provide such bond as the United States may at any time require for damages which may arise under the liability provisions of Section six (6) and seven (7) above.

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Appendix H

Biological Opinion



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
420 South Garfield Avenue, Suite 400
Pierre, South Dakota 57501-5408



July 6, 2015



MEMORANDUM

To: Field Manager, Bureau of Land Management
South Dakota Field Office, Belle Fourche, South Dakota

From: Field Supervisor, U.S. Fish and Wildlife Service *Scott Larson*
South Dakota Ecological Services Field Office, Pierre, South Dakota

Subject: Section 7 Consultation for the South Dakota Proposed Resource Management Plan and Final Environmental Impact Statement

This memorandum is in response to your letter and accompanying Biological Assessment (BA) dated June 22, 2015 requesting concurrence under section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et. seq.) for the Proposed Resource Management Plan and Final Environmental Impact Statement (PRMP). The PRMP describes and analyzes four alternatives (Alternatives A through D) for managing Bureau of Land Management (BLM) - South Dakota Field Office (SDFO) administered lands and minerals in the planning area. The PRMP indicates that Alternative D is the BLM's preferred alternative. The planning area includes the entire state of South Dakota even though BLM lands are not distributed throughout the State.

The BA indicates Alternative D is the alternative for which you are requesting concurrence and that effects determinations were made only for those species found on SDFO-administered lands (surface and mineral). Furthermore the BA stated that the PRMP provides overall guidance for management of BLM-administered lands and many activities will proceed only after the development of specific plans, which will include additional NEPA documentation and further consultation pursuant to section 7(a)(2) of the ESA as appropriate.

Two areas of analysis are discussed in the BA, the Action Area and the Decision Area and are included in the Planning Area. The Action Area is defined as lands within the boundary of the SDFO administrative unit regardless of ownership where BLM decisions may have effects beyond the boundaries of BLM-administered lands and vice versa, and the Decision Area includes only the BLM-administered lands (surface and mineral) within the SDFO administrative area boundary.

In your letter and you made a determination that implementation of the PRMP “may affect, but is not likely to adversely affect” the following species which may be found in the Action Area:

<u>Species</u>	<u>Status</u>	<u>Expected Occurrence</u>
Northern Long-eared Bat (<i>Myotis septentrionalis</i>)	Threatened	Known resident in the Decision Area, seasonal in the Action Area
Black-footed Ferret (<i>Mustela nigripes</i>)	Endangered	Possible in the Decision Area.
Whooping Crane (<i>Grus americana</i>)	Endangered	Migration in the Decision Area
Least Tern (<i>Sterna antillarum</i>)	Endangered	Possible Migration or Nesting in the Decision Area
Piping Plover (<i>Charadrius melodus</i>)	Endangered	Possible Migration or Nesting in the Decision Area
Rufa Red Knot (<i>Calidris canutus rufa</i>)	Threatened	Rare seasonal migrant in the Decision Area
Pallid Sturgeon (<i>Scaphirhynchus albus</i>)	Endangered	Resident in Missouri River
Topeka Shiner (<i>Notropis topeka</i>)	Endangered	Possible in the Decision Area
American Burying Beetle (<i>Nicrophorus americanus</i>)	Endangered	Possible in the Decision Area

Species found within the planning area but not likely to occur in the Decision Area were not analyzed in the BA and are not included in this consultation.

Your letter indicated the Northern Long-eared Bat is the only species likely to regularly occur on BLM managed land and further consultation may be needed in the future at the project level for some activities.

We concur with your conclusion that implementation of the PRMP will not adversely affect listed species. If changes are made in the project plans or operating criteria, or if additional information becomes available, we must be informed so that the above determinations can be reconsidered.

We appreciate the opportunity to provide comments and work with the BLM on the PRMP. If you have any questions, please feel free to contact me at (605) 224-8693, Extension 224, or Terry Quesinberry of this office at (605) 224-8693, Extension 234.

cc: USFWS/National Sage Grouse Coordinator; Cheyenne, WY
(Attention: Pat Deibert)

Appendix I

Greater Sage-Grouse Effects Analysis Process

The BLM will ensure that any activities or projects in Greater Sage-Grouse habitats would: 1) only occur in compliance with the Proposed Final SD RMP and EIS Greater Sage-Grouse goals and objectives for priority and general habitat management areas; and 2) maintain neutral or positive Greater Sage-Grouse population trends and habitat by avoiding, minimizing, and offsetting unavoidable impacts to assure a conservation gain at the scale of this land use plan and within Greater Sage-Grouse population areas, State boundaries, and WAFWA Management Zones through the application of mitigation for implementation-level decisions. The mitigation process will follow the regulations from the White House Council on Environmental Quality (CEQ) (40 CFR 1508.20; e.g., avoid, minimize, and compensate), hereafter referred to as the mitigation hierarchy, while also following Secretary of the Interior Order 3330 and consulting BLM, FWS, and other current and appropriate mitigation guidance. If it is determined that residual impacts on Greater Sage-Grouse from implementation-level actions would remain after applying avoidance and minimization measures to the extent possible, then compensatory mitigation projects will be used to offset residual impacts, or the project may be deferred or denied if necessary to achieve the goals and objectives for priority and general habitat management areas in the Final SD RMP and EIS.

To ensure that impacts from activities proposed in sage-grouse priority and general habitat management areas (PHMA and GHMA) are appropriately mitigated, the BLM will apply mitigation measures and conservation actions and potentially modify the location, design, construction, and/or operation of proposed land uses or activities to comply with statutory requirements for environmental protection. The mitigation measures and conservation actions (Appendix F and C) for proposed projects or activities in these areas will be identified as part of the National Environmental Policy Act (NEPA) environmental review process, through interdisciplinary analysis involving resource specialists, project proponents, government entities, landowners or other Surface Management Agencies. Those measures selected for implementation will be identified in the Record of Decision (ROD) or Decision Record (DR) for those authorizations and will inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands and minerals to mitigate, per the mitigation hierarchy referenced above, impacts from the activity or project such that sage-grouse goals and objectives are met. Because these actions create a clear obligation for the BLM to ensure any proposed mitigation action adopted in the environmental review process is performed, there is assurance that mitigation will lead to a reduction of environmental impacts in the implementation stage and include binding mechanisms for enforcement (CEQ Memorandum for Heads of Federal Departments and Agencies 2011).

To achieve the goals and objectives for PHMA and GHMA in the Proposed Final SD RMP and EIS, the BLM will assess all proposed land uses or activities such as road, pipeline, communication tower, or powerline construction, fluid and solid mineral development, range improvements, and recreational activities proposed for location in sage-grouse PHMA and GHMA in a step-wise manner. The following steps identify a screening process for review of proposed activities or projects in these areas. This process will provide a consistent approach and ensure that authorization of these projects, if granted, will appropriately mitigate impacts and be consistent with the LUP goals and objectives for sage-grouse. The following steps provide for a sequential screening of proposals. However, Steps 2-6 can be done concurrently.

Step 1 – Determine Proposal Adequacy

This screening process is initiated upon formal submittal of a proposal for authorization for use of BLM lands. The actual documentation of the proposal would include at a minimum a description of the location, scale of the project and timing of the disturbance. The acceptance of the proposal(s) for review would be consistent with existing protocol and procedures for each type of use.

Step 2 – Evaluate Proposal Consistency with LUP

This initial review should evaluate whether the proposal would be allowed as prescribed in the Land Use Plan. For example, some activities or types of development are prohibited in PHMA or GHMA. Evaluation of projects will also include an assessment of the current state of the Adaptive Management hard and soft triggers. If the proposal is for an activity that is specifically prohibited, the applicant should be informed that the application is being rejected since it would not be allowed, regardless of the design of the project.

Step 3 – Determine Proposal Consistency with Density and Disturbance Limitations

If the proposed activity occurs within a PHMA, evaluate whether the disturbance from the activity exceeds the limit on the amount of disturbance allowed within the activity or project area (DDCT process). If current disturbance within the activity area or the anticipated disturbance from the proposed activity exceeds this threshold, the project would be deferred until such time as the amount of disturbance within the area has been reduced below the threshold, redesigned so as to not result in any additional surface disturbance (collocation) or redesigned to move it outside of PHMA.

Step 4 – Determine Projected Sage-Grouse Population and Habitat Impacts

Determine if the project will have a direct or indirect impact on sage-grouse populations or habitat within PHMA or GHMA. This will include:

- Reviewing Greater Sage-Grouse Habitat delineation maps to initially assess potential impacts to sage-grouse.

Use of the *USGS report Conservation Buffer Distance Estimates for Greater Sage-Grouse—A Review* to assess potential project impacts based upon the distance to the nearest lek, using the most recent active lek data available from the state wildlife agency. This assessment will be based upon the direction in Appendix B:

- Review and application of current science recommendations.
- Reviewing the 'Base Line Environment Report' (USGS) which identifies areas of direct and indirect effect for various anthropogenic activities.
- Consultation with agency or State Wildlife Agency biologist.
- Evaluating consistency with (at a minimum) State sage-grouse regulations
- Or other methods needed to provide an accurate assessment of impacts.

If the proposal will not have a direct or indirect impact on either the habitat or population, document the findings in the NEPA and proceed with the appropriate process for review, decision and implementation of the project.

Step 5 –Apply Avoidance and Minimization Measures to Comply with Sage-Grouse Goals and Objectives

If the project can be relocated so as to not have an impact on sage-grouse and still achieve objectives of the proposal and the disturbance limitations, relocate the proposed activity and proceed with the appropriate process for review, decision and implementation (NEPA and Decision Record). This Step does not consider redesign of the project to reduce or eliminate direct and indirect impacts, but rather authorization of the project in a physical location that will not impact Greater Sage-Grouse. If the preliminary review of the proposal concludes that there may be adverse impacts to sage-grouse habitat or populations in Step 4 and the project cannot be effectively relocated to avoid these impacts, proceed with the appropriate process for review, decision and implementation (NEPA and Decision Record) with the inclusion of appropriate mitigation requirements to further reduce or eliminate impacts to sage-grouse habitat and populations and achieve compliance with sage-grouse objectives. Mitigation measures could include disturbance buffer limits, timing of disturbance limits, noise restrictions, design modifications of the proposal, site disturbance restoration, post project reclamation, etc. (see BMPs, Guidelines, Standard Operating Procedures (Appendix J), Soil and Reclamation Guidelines (Appendix O and L), and Required Design Features (Appendix C) for a more complete list of measures). Compensatory or offsite mitigation may be required (Step 6) in situations where residual impacts remain after application of all avoidance and minimization measures.

Step 6 – Apply Compensatory Mitigation or Reject / Defer Proposal

If screening of the proposal (Steps 1-5) has determined that direct and indirect impacts cannot be eliminated through avoidance or minimization, evaluate the proposal to determine if compensatory mitigation can be used to offset the remaining adverse impacts and achieve sage-grouse goals and objectives. If the impacts cannot be effectively mitigated, reject or defer the proposal. The criteria for determining this situation could include but are not limited to:

- The current trend within the PHMA is down and additional impacts, whether mitigated or not, could lead to further decline of the species or habitat.
- The proposed mitigation is inadequate in scope or duration, has proven to be ineffective or is unproven in terms of science based approach.
- The project would impact habitat that has been determined to be a limiting factor for species sustainability.
- Other site specific information and analysis that determined the project would lead to a downward change of the current species population or habitat and not comply with sage-grouse goals and objectives.

If, following application of available impact avoidance and minimization measures, the project can be mitigated to fully offset impacts and assure conservation gain to the species and comply with sage-grouse goals and objectives, proceed with the appropriate process for review, decision and implementation (NEPA and Decision Record).

The BLM, via the WAFWA Management Zone Greater Sage-Grouse Conservation Team, will develop a WAFWA Management Zone Regional Mitigation Strategy to guide the application of the mitigation hierarchy to address greater sage-grouse impacts within that Zone. The WAFWA Management Zone Regional Mitigation Strategy will be applicable to the States/Field Offices/Forests within the Zone's boundaries. Subsequently, the BLM South Dakota Field Office NEPA analyses for implementation-level decisions, which have the potential to impact greater sage-grouse, will include analysis of mitigation recommendations from the relevant WAFWA Management Zone Regional Mitigation Strategy(ies).

Implementation of the Regional Mitigation Strategy may involve managing compensatory mitigation funds, implementing compensatory mitigation projects, certifying mitigation/conservation banks, and reporting on the effectiveness of those projects. These types of mitigation implementation actions may be most effectively managed at the State-level, in collaboration with partners. The BLM State Office may find it most effective to enter into an agreement with a State-level program administrator (e.g., Non-Governmental Organization or State-level entity) to help manage these aspects of mitigation. The BLM will remain responsible for making decisions that affect Federal lands.

The BLM's Regional Mitigation Manual MS-1794 serves as a framework for developing and implementing a Regional Mitigation Strategy. Chapter 2 provides additional guidance specific to the development and implementation of a WAFWA Management Zone Regional Mitigation Strategy.

Appendix J

Summary of Mitigation Measures, Best Management Practices (BMPs), Standards, Guidelines, and Standard Operating Procedures (SOPs)

INTRODUCTION

The following Mitigation Measures and Conservation Actions are a compilation of Best Management Practices (BMPs), Standards, and/or operating procedures used by the BLM to meet statutory requirements for environmental protection and comply with resource specific Goals and Objectives set forward in this land use plan. The BLM will apply mitigation measures and conservation actions to modify the operations of authorized lands uses or activities to meet these obligations. Additional direction regarding mitigation can be found in the Interim Policy, Draft - Regional Mitigation Manual Section - 1794 (IM 2013-142) or subsequent decision documents. Required Design Features for sage-grouse are detailed in a separate Appendix (Appendix C).

These measures and actions will be applied to avoid, minimize, rectify, reduce, and compensate for impacts if an evaluation of the authorization area indicates the presence of resources of concern which include, but are not limited to air, water, soils, cultural resources, national historic trails, recreation values and important wildlife habitat in order to reduce impacts associated with authorized land uses or activities such as road, pipeline, or power line construction, fluid and solid mineral development, range improvements, and recreational activities. The mitigation measures and conservation actions for authorizations will be identified as part of the National Environmental Policy Act (NEPA) process, through interdisciplinary analysis involving resource specialists, project proponents, government entities, landowners or other Surface Management Agencies. Those measures selected for implementation will be identified in the Record of Decision (ROD) or Decision Record (DR) for those authorizations and will inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands and minerals to mitigate impacts from those authorizations. Because these actions create a clear obligation for the BLM to ensure any proposed mitigation action adopted in the environmental review process is performed, there is assurance that mitigation will lead to a reduction of environmental impacts in the implementation stage and include binding mechanisms for enforcement (CEQ Memorandum for Heads of Federal Departments and Agencies 2011).

Because of site-specific circumstances and localized resource conditions, some mitigation measures and conservation actions may not apply to some or all activities (e.g., a resource or conflict is not present on a given site) and/or may require slight variations from what is described in this appendix. The BLM may add additional measures as deemed necessary through the environmental analysis and as developed through coordination with other federal, state, and local regulatory and resource agencies. Application of mitigation measures and conservation actions is subject to valid existing rights, technical and economic feasibility.

Implementation and effectiveness of mitigation measures and conservation actions would be monitored to determine whether the practices are achieving resource objectives and accomplishing desired goals. Timely adjustments would be made as necessary to meet the resource goals and objectives.

The list included in this appendix is not limiting, but references the most frequently used sources. The BLM may add additional site-specific restrictions as deemed necessary by further environmental analysis and as developed through coordination with other federal, state, and local regulatory and resource agencies. Because mitigation measures and conservation actions change or are modified, based on new information, the guidelines will be updated periodically. As new publications are developed; the BLM may use updated BMPs. In addition, many BLM handbooks (such as BLM Manual 9113-Roads and 9213-Interagency Standards for Fire and Aviation Operation) also contain BMP-type measures for minimizing impacts. These BLM-specific guidance and direction documents are not referenced in this appendix. The EIS for this RMP does not decide or dictate the exact wording or inclusion of these mitigation measures and conservation actions. Rather, they are used in the RMP and EIS process as a tool to help demonstrate at the Land Use Plan scale how they will be applied in considering subsequent activity plans and site-specific authorizations. These

mitigation measures and conservation actions and their wording are matters of policy. As such, specific wording is subject to change, primarily through administrative review, not through the RMP and EIS process. Any further changes that may be made in the continuing refinement of these mitigation measures and conservation actions and any development of program-specific standard procedures will be handled in another forum, including appropriate public involvement and input.

Within the limits of BLM's authority, specific BMPs or guidelines may be required as a condition of an authorization at the project level (implementation level) to address site-specific circumstances. The use of other BMPs and guidelines would be analyzed on a case-by-case basis during environmental review associated with projects on the BLM land.

Required design features (RDF) to limit impacts to sage-grouse are addressed in Appendix C.

Within the limits of BLM's authority, specific BMPs or guidelines may be required as a condition of an authorization at the project level (implementation level) to address site-specific circumstances. The use of other BMPs and guidelines would be analyzed on a case-by-case basis during environmental review associated with projects on the BLM land. BMPs and guidelines are not a "one size fits all approach" that address all specific circumstances that may occur.

The following practices would be applied as relevant. Note that additional details about Mitigation, Reclamation, and Soil Guidelines can be found in Appendix K (SD Mitigation Guidelines), Appendix L (SD Reclamation Guidelines) and in Appendix O (Soil Monitoring) and Appendix C (RDF for Sage Grouse).

Air Resources BMPs

- I. Climate Change BMPs
- II. Other BMPs, Guidelines, Standards, and SOPs
 - Air Quality Guidelines for Open Burning
 - Air Resources BMPs for Fluid Minerals
 - Aquatic Nuisance Species (ANS) Management Plan, South Dakota
 - Bats and Wind Energy
 - Communication Towers: Service Guidance on Siting, Construction, Operation and Decommissioning
 - Core Terrestrial Indicators and Methods, BLM
 - Field Office Technical Guides, USDA Natural Resources Conservation Service (NRCS)
 - Fluid Minerals Operations – Reducing Preventable Causes of Direct Wildlife Mortality
 - Forestry Best Management Practices for South Dakota
 - Guidelines for Livestock Grazing Management, Montana/Dakotas (Dakotas Portion)
 - Integrated Vegetation Management Handbook
 - Interagency Burned Area Rehabilitation Guidebook
 - Interagency Standards for Fire and Fire Aviation Operations
 - Interpreting Indicators of Rangeland Health
 - Invasive Species National Management Plan 2008-2012
 - Keep Aquatic Nuisance Species out of South Dakota Waters
 - Land-Based Wind Energy Guidelines, U.S. Fish and Wildlife Service
 - Management of Land Boundary Plans
 - Mitigation Guidelines, South Dakota Field Office
 - Monitoring Guidelines for Soils
 - National Management Measures to Control Nonpoint Source Pollution from Agriculture
 - National Range and Pasture Handbook
 - Reclamation Guidelines, South Dakota
 - Renewable Energy Facilities on BLM-Administered Lands: Best Management Practices for Reducing Visual Impact
 - Riparian Area Management: Grazing Management Processes and Strategies for Riparian-Wetland Areas
 - Selected Practices for Avian Protection on Power Lines
 - Siting Guidelines for Wind Power Projects in South Dakota
 - Standards for Federal Lands Boundary Evidence, 600 DM 5
 - Standards for Rangeland Health and Guidelines for Livestock Grazing Management

- Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development
- Upland Soil Erosion Monitoring and Assessment: An Overview
- Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States
- Wind Energy Development Programmatic EIS

I. Air Resources BMPs

Developed by: Bureau of Land Management

Year developed or last updated: 2012

Impacts to air resources and air quality related values (AQRVs) can be reduced using the following BMPs:

A. Fugitive dust emissions can be reduced by:

1. using two-track primitive roads whenever possible rather than developing a dirt road;
2. applying water or chemical suppressants (e.g., magnesium chloride, calcium chloride, lignin, sulfonate, or asphalt emulsion) to non-primitive unpaved roads or surfacing non-primitive unpaved roads with gravel, chip-seal, or asphalt;
3. imposing vehicle speed limits on unpaved roads;
4. restricting the extent of surface impacts during construction activities and ongoing operations by using directional drilling to reduce the number of oil and gas well pads when feasible;
5. using dust abatement techniques before, during, and after surface clearing and excavation activities;
6. covering construction materials and stockpiled soils if they are a source of fugitive dust;
7. suspending construction activities during high winds;
8. adding gravel to non-reclaimed well pad areas;
9. revegetating areas when construction is complete;
10. locating linear facilities in the same or parallel trenches and constructing them at the same time; and
11. mowing rather than removing vegetation.

B. Fugitive dust and vehicle exhaust emissions related to oil and gas activity can be reduced by restricting vehicle trips by:

1. consolidating facilities by using directional drilling and multiwell oil and gas pads;
2. developing centralized liquid collection (water, produced water, and fracturing liquid) facilities and production (treatment and product storage) facilities to reduce the number and average distance of vehicle trips;
3. using shuttles or vanpools for employee commuting;
4. using automated equipment and remote telemetry; and
5. using solar power to add automated equipment in areas without access to electricity.

C. Non-vehicular engine exhaust emissions can be reduced by:

1. electrifying equipment when feasible;
2. using natural gas or electric engines rather than diesel engines;
3. using alternative energy (solar power, wind power, or both) to power new water source developments; and
4. converting power sources at existing water well developments to alternative energy sources.

D. Fugitive volatile organic compound (VOC), hazardous air pollutant (HAP), and/or methane (a greenhouse gas [GHG]) emissions from oil and gas activities can be reduced by the following BMPs when feasible:

1. using green completion technology to capture methane (and some VOC and HAP) emissions during completion and place the gas in sales pipelines;
2. using flaring rather than venting during completion activities, but only in cases where product capture is

- not feasible;
 - 3. using closed tanks rather than open tanks or pits;
 - 4. installing vapor recovery units on condensate, produced water, and oil storage tanks;
 - 5. using vapor balancing during condensate and oil tanker truck loading;
 - 6. using closed-loop drilling;
 - 7. replacing pneumatic (natural gas) pumps with electric or solar pumps;
 - 8. optimizing glycol circulation rates on glycol dehydrators;
 - 9. replacing wet seals with dry seals in centrifugal compressors;
 - 10. replacing worn rod packing in reciprocating compressors;
 - 11. installing automated plunger lift systems in natural gas wells; and
 - 12. monitoring equipment leaks and repairing equipment leaks.
- E. Sulfur dioxide (SO₂) emissions would be reduced by:
- 1. using ultra-low sulfur diesel fuel in diesel vehicle and stationary engines.

II. Climate Change BMPs

Impacts to climate change can be reduced using the following BMPs:

- A. Reduce CO₂ emissions by reducing vehicle miles traveled and using fuel-efficient vehicles.
- B. Reduce CO₂ emissions by using renewable energy to power equipment.
- C. Reduce CO₂ emissions by using energy saving techniques.
- D. Identify and implement methods to sequester CO₂.
- E. Reduce methane emissions from oil and gas activities by:
 - 1. capturing methane using green completion, when feasible, and beneficially using the gas by placing it in sales pipeline;
 - 2. flaring methane during well completion activities for which green completion is infeasible;
 - 3. replacing natural gas driven pneumatic equipment with solar or electrically powered equipment;
 - 4. optimizing glycol recirculation rates for glycol dehydrators;
 - 5. operating flash tank separators on glycol dehydrators; identifying fugitive emissions from equipment leaks and repairing or replacing seals, valves, compressor rod packing systems, and pneumatic devices; and
 - 6. implementing additional GHG emission reduction strategies identified in the oil and gas BMPs located at EPA Natural Gas STAR Program, <http://www.epa.gov/gasstar/tools/recommended.html>

III. Other BMPs, Guidelines, Standards, and SOPs

The following BMPs are described in detail elsewhere in this document or published separately. A summary and description of each is provided here:

- **Air Quality Guidelines for Open Burning**
Source: State of South Dakota
Online at: <http://denr.sd.gov/des/eq/openburn.aspx>
Developed/Updated: 2010
Activities Affected: Air Quality, Recreation, prescribed fire.
Description: Provides guidelines to follow when open burning. Guidelines address visibility and smoke dispersion, hazardous waste issues, notification of other parties.
- **Air Resources BMPs for Fluid Minerals**
Source: BLM
Online at:

http://www.blm.gov/style/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE_PROTECTION/_bmps.Par.60203.File.dat/WO1_Air%20Resource_BMP_Slideshow%2005-09-2011.pdf

Developed/Updated: 2011

Activities Affected: Air Quality, Oil and Gas exploration and development.

Description: This summary of various Air Resource BMPs outline common problems associated with fluid mineral production that can impact air quality and describes practices that reduce emissions. Examples of topics addressed include centralized water storage and delivery, centralizing of production, dust control, vehicle traffic, venting/ flaring, vapor recovery units, hatches, seals and valves. This summary also describes maintenance and monitoring practices.

Additional information about Air Resource BMPs can be found at:

- EPA Natural Gas STAR Program: online at <http://www.epa.gov/gasstar/tools.recommended.html>
- California Air Resources Board's Clearinghouse: online at <http://www.arb.ca.gov/cc/non-co2-clearinghouse/non-co2-clearinghouse.htm>
- Four Corners Air Quality Group: online at <http://www.nmenv.state.nm.us/aqb/4C/>

- **Aquatic Nuisance Species (ANS) Management Plan, South Dakota**

Source: South Dakota Department of Game, Fish and Parks

Online at: <http://gfp.sd.gov/wildlife/nuisance/aquatic/SDANS-management-plan.aspx>

Developed/Updated: 2008

Activities Affected: Recreation, invasive species control.

Description: The development of a state ANS management plan, as called for in Section 1204 of the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) of 1990, provides an opportunity for federal cost-share support for implementation of the plan. This management plan was developed to address the prevention, control, and effects of aquatic nuisance species that have invaded or may invade South Dakota's waters.

- **Bats and Wind Energy**

Source: Bats and Wind Energy Cooperative in partnership with other organizations and agencies

Online at: <http://www.batsandwind.org/>

Developed/Updated: 2011

Activities Affected: Renewable resources, wildlife

Description: Provides research, mitigation and operating deterrents to reduce the impacts of wind farms on bats. Currently, there are three areas of research BWEC is focusing on. These themes are designed to encompass a variety of approaches to resolve the issue of bat fatalities at wind facilities:

- Pre-construction monitoring to assess bat activity levels and use at proposed wind turbine sites.
- Post-construction fatality searches to determine estimates of fatality, compare fatality estimates among facilities, and determine patterns of fatality in relation to weather and habitat variables.
- Operational Mitigation and Deterrents will focus on testing the effectiveness of seasonal low wind shutdowns and deterring devices on reducing fatality of bats.

- **Communication Towers: Service Guidance on Siting, Construction, Operation and Decommissioning**

Source: BLM

Online at: http://www.fws.gov/habitatconservation/com_tow_guidelines.pdf

Developed/Updated: 2014

Activities Affected: Air Quality, recreation, renewable resources

Description: These guidelines were developed by Service personnel from research conducted in several eastern, midwestern, and southern States, and have been refined through Regional review. They are based on the best information available at this time, and are the most prudent and effective measures for avoiding bird strikes at towers. These guidelines promote collocation and reduction of the number of towers. They also address the height of towers, use of guy wires markers, minimizing the footprint of sites, relocation of sites away from important habitat and removal of obsolete towers and other impacts of communication sites on wildlife.

- **Core Terrestrial Indicators and Methods, BLM**

Source: BLM

Reference: Technical Reference 440

Online at: <http://www.blm.gov/nstc/library/pdf/TN440.pdf>

Developed/Updated: 2011

Activities Affected: Range, vegetation and soil monitoring

Description: The BLM Assessment, Inventory, and Monitoring (AIM) Strategy was initiated, in part, to evaluate current monitoring activities and recommend procedures to improve the efficiency and effectiveness of these activities. To this end, the AIM Strategy supports an integrated approach to: (1) document the location and abundance of natural resources on public lands; (2) facilitate the description of resource conditions; and (3) identify natural resource trends or changes. This recommendation will be accomplished through the integration of fundamental processes including: (a) development and application of a consistent set of ecosystem indicators (i.e., quantitative core indicators) and consistent measurement methods; (b) development and implementation of a statistically valid sampling framework; (c) application and integration of remote sensing technologies; and (d) implementation of related data acquisition and management plans. The purpose/intent of this report is to provide an introduction to, and describe, the Core Indicators and Methods component of the AIM Strategy. Further, this report provides guidance on how to maintain consistency of effort and resources (i.e., cited materials) for further details on established protocols. This Core Indicators and Methods component identifies a small set of core indicators (i.e., measurements) that, when collected, can be used for many purposes across ecosystem types including rangeland, forest, and riparian areas. This set of core indicators, based on quantitative land cover and vegetation data using standardized measurements, will allow data to be integrated across field, district, and state office boundaries.

- **Field Office Technical Guides, USDA Natural Resources Conservation Service (NRCS)**

Source: NRCS

Online at: <http://efotg.sc.egov.usda.gov/toc.aspx?CatID=13668>

Developed/Updated: Various dates; guides are updated periodically

Activities Affected: Range, riparian, soils, reclamation, wildlife, recreation, weed control.

Description: The practices and standards developed by NRCS address water quality, sediment, erosion control, streambank and shoreline protection, weed control, livestock grazing, habitat restoration and other aspects of natural resource management. With the exception of the farming practices, many of the standards and practices have applicability to BLM management and may be applied as needed to protect resources, reduce conflicts, and limit impacts associated with resource use.

- **Fluid Minerals Operations – Reducing Preventable Causes of Direct Wildlife Mortality**

Source: BLM

Reference: Instruction Memorandum No. 2013-033

Online at:

http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2013/IM_2013-033.html

Developed/Updated: 2012

Activities Affected: Oil and gas, wildlife

Description: This Instruction Memorandum (IM) establishes policy for reducing preventable causes of direct wildlife mortality associated with fluid mineral facilities authorized by the Bureau of Land Management (BLM). This policy also provides for increased protection of livestock and human health and safety around fluid mineral facilities. Fluid mineral facilities include oil, gas, and geothermal facilities and associated structures authorized by the BLM through Applications for Permit to Drill (APD), Geothermal Drilling Permits (GDP), Sundry Notices, or fluid mineral associated rights-of-way.

This IM addresses Best Management Practices (BMP) for reducing the risk of direct wildlife mortality from the following five fluid mineral practices:

- Open Pits and Tanks Containing Freestanding Liquids;
- Chemical Tank Secondary Containment;
- Pit, Tank, and Trench Entrapment Hazards;
- Exhaust Stacks; and
- Wire Enclosure Fences for Well Pads or Production Facilities and Associated Rights-of-way.

- **Forestry Best Management Practices for South Dakota**

Source: South Dakota Department of Agriculture

Online at: <https://sdda.sd.gov/legacydocs/Forestry/publications/PDF/Forestry-BMP.pdf>

Developed/Updated: 2003

Activities Affected: Forestry, soils, water quality, weed control.

Description: Describes management practices to reduce impacts from logging and other harvest practices. The BMPs address:

- Forest watersheds and non-point source pollution
- Road maintenance and construction
- Timber harvest design
- Streamside management
- Stream crossings
- Winter logging
- Hazardous substances

- **Guidelines for Livestock Grazing Management, Montana/Dakotas (Dakotas Portion)**

Source: BLM

Reference: BLM/MT/PL-019+1020

Online at:

http://www.blm.gov/style/medialib/blm/mt/blm_programs/grazing.Par.70770.File.dat/DakotasSG.pdf

Developed/Updated: 1997

Activities Affected: Range, vegetation, soils wildlife, water quality.

Description: Guidelines for grazing management are preferred or advisable approaches to grazing management practices determined to be appropriate to ensure that standards can be met or that significant progress can be made toward meeting the standard(s).

Guidelines are provided to maintain or improve resource conditions in upland and riparian habitats available for livestock grazing. In both riparian and upland habitats, these guidelines focus on establishment and maintenance of proper functioning condition and healthy rangelands. The application of these guidelines is dependent on individual management objectives.

- **Integrated Vegetation Management Handbook**

Source: BLM

Reference: H-1740-2

Online at:

http://www.blm.gov/style/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.59510.File.dat/H-1740-2.pdf

Developed/Updated: 2008

Activities Affected: Range, weeds, reclamation

Description: The BMPs describe practices to limit impacts of vegetation treatment to:

- Invasive plant species
- Soil resources
- Native plant conservation and revegetation
- Using pesticide and biological controls
- Air quality
- Wildlife habitat
- Cultural and historic resources
- Water quality and wetlands
- Recreation, visual, and wilderness resources

- **Interagency Burned Area Rehabilitation Guidebook**

Source: BLM, NPS, FWS, BIA

Reference:

Online at: http://www.fws.gov/fire/ifcc/Esr/Policy/BAR_Guidebook11-06.pdf

Developed/Updated: 2006

Activities Affected: Fire, reclamation, wildlife soils and vegetation

Description: The purpose of the Interagency Burned Area Rehabilitation Guidebook (Guidebook) is to provide general operational guidance for the Department of the Interior Burned Area Rehabilitation (BAR) activities after a wildfire. In conjunction with Departmental and agency policy, it is designed to provide agency administrators and BAR specialists with sufficient information to:

- Understand BAR policy, standards, and procedures.
- Assess wildfire damage and develop a cost effective plan or report.
- Assess and report accomplishments.

It consolidates and provides an interagency interpretation of BAR policies, procedures, objectives, and standards where there is Departmental and agency agreement.

- **Interagency Standards for Fire and Fire Aviation Operations**

Source: BLM, NPS, USFWS, and USFS

Reference: NFES 2724

Online at: <http://www.nifc.gov/PUBLICATIONS/redbook/2014/RedBookAll.pdf>

Developed/Updated: 2012

Activities Affected: Fire, aviation, and safety

Description: This is an interagency publication that provides guidance and policy direction for the federal fire program. Includes standards for firefighting, identifies roles of agencies, clarifies administration process, safety procedures, incident management, fire suppression, training, equipment, communications, aviation operations/resources, prescribed fire, and reviews and investigations.

- **Interpreting Indicators of Rangeland Health**

Source: BLM

Reference: Technical Reference 1734-6

Online at: <http://www.blm.gov/nstc/library/pdf/1734-6rev05.pdf>

Developed/Updated: 2005

Activities Affected: Range, soils, wildlife, and water quality.

Description: This book describes a protocol for using 17 qualitative soil and vegetation indicators to evaluate the status of three ecosystem attributes: soil and site stability, hydrologic function, and biotic integrity. Qualitative assessments of rangeland health provide land managers and technical assistance specialists with a good communication tool for use with the public. Many of these tools have been used successfully for this purpose over the past 100 years. The technique described in this book can be used to provide early warnings of resource problems on upland rangelands. It can also be used to help identify specific resource issues (e.g., erosion or invasive species) that must be addressed and to prioritize land for management resources. Version 4 is the second published edition of this technique. The changes in Version 4 are designed to improve the consistency in the application of the process. The most significant modification was the replacement of the Ecological Reference Area Worksheet with the Reference Sheet. The Reference Sheet facilitates consistent application of the process throughout an ecological site by integrating all available sources of data and knowledge to generate a single range of reference conditions for each indicator.

- **Invasive Species National Management Plan 2008-2012**

Source: National Invasive Species Management Council (NISC)

Online at: <http://www.invasivespecies.gov>

Developed/Updated: 2008

Activities Affected: All activities

Description: Directs federal efforts (including overall strategy and objectives) to prevent, control and minimize invasive species and their impacts for fiscal years 2008 through 2012.

- **Keep Aquatic Nuisance Species out of South Dakota Waters**

Source: South Dakota Department of Game, Fish and Parks

Online at: <http://gfp.sd.gov/wildlife/nuisance/aquatic/default.aspx>

Developed/Updated: 2008

Activities Affected: Invasive species control, recreation

Description: Provides practices and guidelines to reduce the threat of the introduction and spread aquatic nuisance species.

- **Land-Based Wind Energy Guidelines, U.S. Fish and Wildlife Service**

Source: USFWS

Reference: OMB Control No, 1018-0148

Online at: http://www.fws.gov/ecological-services/es-library/pdfs/WEG_final.pdf

Developed/Updated: 2012

Activities Affected: Renewable energy and wildlife.

Description: The Guidelines discuss various risks to “species of concern” from wind energy projects, including collisions with wind turbines and associated infrastructure; loss and degradation of habitat from turbines and infrastructure; fragmentation of large habitat blocks into smaller segments that may not support sensitive species; displacement and behavioral changes; and indirect effects such as increased predator populations or introduction of invasive plants. The Guidelines assist developers in identifying species of concern that may potentially be affected by their proposed project, including migratory birds; bats; bald and golden eagles and other birds of prey; prairie and sage grouse; and listed, proposed, or candidate endangered and threatened species. Wind energy development in some areas may be precluded by federal law; other areas may be inappropriate for development because they have been recognized as having high wildlife value based on their ecological rarity and intactness.

The Guidelines use a “tiered approach” for assessing potential adverse effects to species of concern and their habitats. The tiered approach is an iterative decision-making process for collecting information in increasing detail; quantifying the possible risks of proposed wind energy projects to species of concern and their habitats; and evaluating those risks to make siting, construction, and operation decisions. During the pre-construction tiers (Tiers 1, 2, and 3), developers are working to identify, avoid and minimize risks to species of concern. During post construction tiers (Tiers 4 and 5), developers are assessing whether actions taken in earlier tiers to avoid and minimize impacts are successfully achieving the goals and, when necessary, taking additional steps to compensate for impacts. Subsequent tiers refine and build upon issues raised and efforts undertaken in previous tiers. Each tier offers a set of questions to help the developer evaluate the potential risk associated with developing a project at the given location. Briefly, the tiers address:

- Tier 1 – Preliminary site evaluation (landscape-scale screening of possible project sites)
- Tier 2 – Site characterization (broad characterization of one or more potential project sites)
- Tier 3 – Field studies to document site wildlife and habitat and predict project impacts
- Tier 4 – Post-construction studies to estimate impacts
- Tier 5 – Other post construction studies and research

The tiered approach provides the opportunity for evaluation and decision-making at each stage, enabling a developer to abandon or proceed with project development, or to collect additional information if required. This approach does not require that every tier, or every element within each tier, be implemented for every project. The Service anticipates that many distributed or community facilities will not need to follow the Guidelines beyond Tiers 1 and 2. Instead, the tiered approach allows efficient use of developer and wildlife agency resources with increasing levels of effort.

- **Management of Land Boundary Plans – BLM**

Source: BLM

Description: Provides information about the BLM cadastral survey program, its support of BLM programs. The cadastral survey program assists federal, tribal, and Alaska Native land management agencies by interpreting and analyzing survey plats, locating boundary markers in the field, and performing new and retracement cadastral surveys when necessary evidence can be done by the standards for boundary evidence certificate process, instead of having a full survey. Other services involve surveys to assist in: the resolution of trespass upon public lands, defining the boundaries of timber sales, rights-of-way, leasing lands to local communities under the Recreation and Public Purposes Act, identifying boundaries of lands to be exchanged and other services.

Online

at: http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION/lands_and_realty.Par.31679.File.dat/Mgmt%20of%20Land%20Boundaries.pdf

- **Mitigation Guidelines, South Dakota Field Office**

Source: BLM, SDFO

Reference: SD RMP and EIS. See Appendix K for full details.

Online at: <http://blm.gov/m1kd>. Refer to Appendix K

Developed/Updated:

Activities Affected: Surface disturbing activities

Description: South Dakota Field Office (SDFO) Mitigation Guidelines are a compilation of practices employed by the Bureau of Land Management (BLM) to mitigate impacts from surface disturbance. They apply to activities such as road or pipeline construction, range improvements, and permitted recreation activities. These guidelines are designed primarily to address soil and water concerns but they also address air, vegetation, wildlife habitat, and cultural or historic properties.

The guidelines are presented as an appendix of the Resource Management Plan (RMP) for easy reference, as they apply to many resources and derive from many laws. This list included in the appendix is not comprehensive and is intended to be used as a guide for appropriate project planning, design, and implementation within the SDFO. Because mitigation measures change or are modified, based on new information, the guidelines are updated periodically for SDFO.

Specific conservation actions and mitigation measures for sage-grouse management can be found in the mitigation section of the Chapter 2 summary and in Appendix F.

The purpose of the SDFO Mitigation Guidelines is (1) to reserve, for BLM, the right to modify the operations of all surface and other human presence disturbance activities as part of the statutory requirements for environmental protection, and (2) to inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands.

Application of the mitigation guidelines to all surface and other human presence disturbance activities concerning BLM-administered public lands and resources will also provide more uniformity in mitigation than has occurred in the past. These guidelines are primarily intended for the purpose of consistency in the ways requirements are determined for avoiding and mitigating environmental impacts and resource and land use conflicts. Consistency in this sense does not mean that identical requirements would be applied for all similar types of land use activities that may cause similar types of impacts. It also does not mean that the requirements or guidelines for a single land use activity would be identical in all areas. Individual measures may not be appropriate for every situation and would be analyzed on a case-by-case basis.

Those resource activities or programs currently without a standardized set of permit or operation stipulations can use the mitigation guidelines as stipulations or as conditions of approval, or as a baseline for developing specific stipulations for a given activity or program.

Mitigation employs measures that have been developed to reduce environmental impacts associated with certain types of activities. Best Management Practices (BMPs) are mitigation measures designed to reduce undesirable impacts to the environment. Incorporation of mitigation can typically result in a more efficient environmental review process, increased operating efficiency, reduced reclamation, and less environmental impacts (The Gold Book 2007).

Objectives:

- Use avoidance or relocation as the preferred strategy for reducing potential adverse effects.
- Employ as much mitigation as possible during planning.
- Minimize surface disturbance effects of operations and maintain the reclamation potential of the site through design, construction, and other practices/techniques.
- Reduce impacts to soil and water resources. Eliminate sources of ground water and surface water contamination.
- Manage Invasive Species
- Reduce impacts to air resources
- Develop and implement a mitigation monitoring and reporting strategy

Guidelines for installation of culverts and waterbody crossings are included to address erosion, scour, seepage, impedance of flow, fish passage and blockage of drainages.

- **Monitoring Guidelines for Soils**

Source: BLM

Reference: RMP and EIS, Appendix O

Online at: <http://blm.gov/m1kd>. Refer to Appendix O

Developed/Updated: 2009

Activities Affected: Surface disturbing activities, reclamation, soils and vegetation.

Description: Provides monitoring direction and monitoring criteria for soils. Considers erosion, streambanks, floodplains, riparian areas, soil salinization, sodification, compaction, rutting, productivity, fill material and subsidence. Lists techniques, unit of measures, frequency and duration of monitoring, remedial action triggers, and management option.

- **National Management Measures to Control Nonpoint Source Pollution from Agriculture**

Source: EPA

Reference: EPA 841-B-03-004

Online at: http://water.epa.gov/polwaste/nps/agriculture/agmm_index.cfm

Developed/Updated: 2003

Activities Affected: Wide variety of activities including livestock grazing

Description: A technical guidance and reference document for use by State, local, and tribal managers in the implementation of nonpoint source pollution management programs. It contains information on the best available, economically achievable means of reducing pollution of surface and ground water from agriculture. Note that Chapter 4e specifically relates to grazing management.

- **National Range and Pasture Handbook**

Source: NRCS

Reference: 190vi-NRPH

Online at: <http://directives.sc.egov.usda.gov/viewerFS.aspx?hid=18937>

Developed/Updated: 2003

Activities Affected: Livestock grazing, soil, vegetation and water quality.

Description: The National Range and Pasture Handbook provide procedures in support of NRCS policy for the inventory, analysis, treatment, and management of grazing land resources. Revision 1 of the handbook contains revisions to incorporate current concepts and format for developing rangeland ecological site descriptions and forage suitability group descriptions. Information was added regarding the effects of vegetation, grazing, and management on rangeland and pastureland hydrology and erosion.

- **Reclamation Guidelines, South Dakota**

Source: BLM, SDFO

Reference: SD RMP and EIS. Refer to Appendix L.

Online at: <http://blm.gov/m1kd>. Refer to Appendix L for full details.

Developed/Updated:

Activities Affected: Surface disturbing activities, reclamation, minerals

Description: Reclamation would be required for surface disturbing activities (BLM surface only) that disturb vegetation and/or mineral/soil resources. The reclamation of a site aims to set the perpetual course for the planned future condition of a site, including eventual ecosystem restoration by natural processes. Prior to a surface disturbing activity the site would be evaluated on a case-by-case basis, including an on-site assessment if necessary, and mitigation measures would be enacted where appropriate. Reclamation plans would be site-specific, project-specific, and incorporate the project's complexity, environmental concerns, and reclamation potential. This appendix gives guidance for appropriate reclamation planning prior to authorization and following surface disturbance.

These reclamation guidelines apply to all surface disturbing activities, including BLM initiated activities, and must be addressed in each reclamation plan. These guidelines must be met prior to release of the bond and/or reclamation liability. Where these reclamation guidelines differ from more stringent, applicable, laws, rules, and regulations, those standards replace this policy.

Objectives include:

- Manage all waste materials
- Ensure subsurface integrity and eliminate sources of ground and surface water contamination
- Re-establish slope stability, surface stability, and desired topographic diversity.
- Reconstruct and stabilize water courses and drainage features.
- Maintain the biological, chemical, and physical integrity of the soil resource.
- Prepare site for revegetation.
- Establish a desired, self-perpetuating, native plant community.
- Re-establish complementary visual composition.
- Manage Invasive Species
- Develop and implement a reclamation monitoring and reporting strategy.

- **Renewable Energy Facilities on BLM-Administered Lands: Best Management Practices for Reducing Visual Impact**

Source: BLM

Reference: BLM/WY/PL-13/013+1340

Online at: http://www.blm.gov/wo/st/en/prog/energy/renewable_energy.html

Developed/Updated: 2013

Activities Affected: Renewable energy, including wind, solar, and geothermal

Description: This BMP presents information about the visual characteristics of renewable energy facilities and BMPs for avoiding or reducing visual impacts from the facilities. It presents the visual characteristics and BMPs for wind energy facilities, solar energy facilities, and geothermal facilities. It also provides BMPs for “common elements,” which include ancillary facilities common to utility-scale energy facilities as well as the design, construction, operation, and decommissioning activities common to large-scale energy development projects. The common element BMPs presented ancillary facilities include BMPs for electric transmission systems, roads and other surfaces, structures, and signs. The common element BMPs for design, construction, operation, and decommissioning activities include the following:

- Visual impact analysis and mitigation planning;
- Facility siting and design;
- Structure design and materials selection;
- Materials surface treatments;
- Lighting design and operation;
- Avoiding unnecessary disturbance;
- Soil management and erosion control;
- Vegetation management;
- Interim and long-term reclamation; and
- “Good housekeeping” practices.

- **Riparian Area Management: Grazing Management Processes and Strategies for Riparian-Wetland Areas**

Source: BLM

Reference: Technical Reference 1737-20

Online at: <http://www.blm.gov/or/programs/nrst/files/Final%20TR%201737-20.pdf>

Developed/Updated: 2006

Activities Affected: Livestock grazing, wildlife, riparian, vegetation and soils.

Description: This technical reference provides the most current information to further assist livestock operators and land managers in developing successful riparian-wetland grazing management strategies across a wide array of land types. It is also the core document for the Grazing Management for Riparian-Wetlands training course. This technical reference does not set forth a specific formula for identifying the type of grazing strategy best suited for an area. Rather, it provides information to help design appropriate grazing strategies so that soil and vegetation aspects, water issues, and wildlife and livestock needs are addressed in a collaborative manner.

- **Selected Practices for Avian Protection on Power Lines**

Source: Avian Power Line Interaction Committee

Online at: <http://www.aplic.org>

Developed/Updated: 2012

Activities Affected: Power line ROWs and wildlife.

Description: Provides practices and guidelines to limit power line hazards to birds. Provides engineers, biologists, utility planners and the public with a comprehensive resource for eliminating or reducing avian electrocutions and collisions, and highlights management options and cooperative partnerships.

- **Siting Guidelines for Wind Power Projects in South Dakota**

Source: The South Dakota Bat Working Group in cooperation with the South Dakota Department of Game, Fish and Parks.

Online at: <http://gfp.sd.gov/wildlife/docs/wind-power-siting-guidelines.pdf>

Developed/Updated:

Activities Affected: Renewable energy and wildlife.

Description: Siting guidelines for wind power developers and other stakeholders to utilize as they consider potential wind power sites in South Dakota. These guidelines address issues/concerns associated with the preconstruction, construction or post-construction of wind turbines and have been divided into eleven general categories:

- Natural and Biological Resources
- Noise
- Visual Resources
- Public Interaction
- Soil Erosion and/or Water Quality
- Health and Safety
- Cultural, Archaeological, and Paleontological Resources
- Socioeconomic, Public Services, and Infrastructure
- Solid and Hazardous Wastes
- Air Quality and Climate

- **Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development**

Source: BLM

Reference: BLM/WO/ST-06/021+3071

Online at: http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/gold_book.html

Developed/Updated: 2007

Activities Affected: Oil and Gas and resources impacted by oil and gas development.

Description: BMPs for oil and gas demonstrate practical ideas which may eliminate or minimize adverse impacts from oil and gas development to public health and the environment, landowners, and natural resources; enhance the value of natural and landowner resources; and reduce conflict.

- **Standards for Boundary Evidence - Cadastral Survey**

Source: BLM

Description: Details the Bureau's plan to ensure Cadastral Survey review of boundary evidence prior to the approval of significant land and resource transactions and commercial

projects. http://www.blm.gov/wo/st/en/prog/more/cadastralsurvey/cadastral_review_of.html

- **Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Montana and the Dakotas.**

Source: BLM

Description: Provides standards for rangeland health for uplands, riparian areas, water quality, air quality, and habitat. Includes guidelines for proper management of livestock on public lands.

<http://www.blm.gov/mt/st/en/prog/grazing.html>

- **Upland Soil Erosion Monitoring and Assessment: An Overview**

Source: BLM

Reference: Technical Note 438

Online at: <http://www.blm.gov/nstc/library/pdf/TN438.pdf>

Developed/Updated: 2011

Activities Affected: Livestock grazing, soils, vegetation and reclamation

Description: This technical note is intended to aid resource specialists in evaluating techniques for monitoring and assessing upland soil surface erosion, other than gully erosion. A brief discussion of erosion processes is incorporated in this document. Highlighted monitoring techniques include visual indicators of erosion, watershed cover, remote sensing cover, silt fence catchments, erosion bridge, erosion plots, close-range photogrammetry, and cesium-137. An overview, brief discussion on procedure, advantages and disadvantages, and data analysis considerations are summarized for each monitoring technique.

- **Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States**

Source: BLM

Reference: ROD 11-29-2007

Online at: http://www.blm.gov/wo/st/en/prog/more/veg_eis.html

Developed/Updated: 2007

Activities Affected: Weeds, reclamation

Description: This document outlines the specific decisions, standard operating procedures, and mitigation measures based on the Final Programmatic EIS concerning the use of herbicides in the Bureau of Land Management integrated pest management program.

- **Wind Energy Development Programmatic EIS**

Source: BLM

Reference: FEIS Chapter 2 (Section 2.2.3.2)

Online at: <http://windeis.anl.gov>

Developed/Updated: 2010

Activities Affected: Renewable energy and resources impacts by development of wind energy.

Description: As part of the proposed action, BLM developed BMPs for each major step of the wind energy development process, including site monitoring and testing, plan of development preparation, construction, operation, and decommissioning. General BMPs are available for each step, and certain steps also include specific BMPs to address the following resource issues: wildlife and other ecological resources, visual resources, roads, transportation, noise, noxious weeds and pesticides, cultural/historic resources, paleontological resources, hazardous materials and waste management, storm water, human health and safety, monitoring program, air emissions and excavation and blasting activities.

Note: Although the Wind Energy Development Programmatic EIS addressed only the 11 western states and did not include South Dakota, the BMPs, Guidelines and Standard Operating Procedures described in this EIS may be utilized as projects are proposed and implemented.

Appendix K

South Dakota Field Office Soil, Water and Reclamation Mitigation Guidelines

Introduction

South Dakota Field Office (SDFO) Mitigation Guidelines are a compilation of practices employed by the Bureau of Land Management (BLM) to mitigate impacts from surface disturbance. They apply to activities such as road or pipeline construction, range improvements, permitted recreation activities and other activities that result in surface disturbance. The guidelines are designed to protect resources such as soil, water, air, vegetation, wildlife habitat, and cultural or historic properties. The guidelines are not land use decisions; rather they are examples of mitigation measures that could be applied, as appropriate, based on site-specific National Environmental Policy Act (of 1969) (NEPA) analysis for individual proposals. Refer also to Reclamation Guidelines in Appendix L.

The guidelines are presented as an appendix of the Resource Management Plan (RMP) for easy reference, as they apply to many resources and derive from many laws. This list included in the appendix is not comprehensive and is intended to be used as a guide for appropriate project planning, design, and implementation within the SDFO. Because mitigation measures change or are modified, based on new information, the guidelines are updated periodically for SDFO.

Specific conservation actions and mitigation measures for sage grouse management can be found in the mitigation section of the Chapter 2 summary and in Appendix F. In addition to the practices described in this Appendix, Appendix J provides Best Management Practices, Guidelines and Standard Operating Procedures to avoid or reduce the impacts of various actions or activities.

Purpose

The purpose of the SDFO Mitigation Guidelines is (1) to reserve, for BLM, the right to modify the operations of all surface and other human presence disturbance activities as part of the statutory requirements for environmental protection, and (2) to inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands.

Application of the mitigation guidelines to all surface and other human presence disturbance activities concerning BLM-administered public lands and resources will also provide more uniformity in mitigation than has occurred in the past. These guidelines are primarily intended for the purpose of consistency in the ways requirements are determined for avoiding and mitigating environmental impacts and resource and land use conflicts. Consistency in this sense does not mean that identical requirements would be applied for all similar types of land use activities that may cause similar types of impacts. It also does not mean that the requirements or guidelines for a single land use activity would be identical in all areas. Individual measures may not be appropriate for every situation and would be analyzed on a case-by-case basis.

Those resource activities or programs currently without a standardized set of permit or operation stipulations can use the mitigation guidelines as stipulations or as conditions of approval, or as a baseline for developing specific stipulations for a given activity or program.

Mitigation Goals

Mitigation employs measures that have been developed to reduce environmental impacts associated with certain types of activities. Best Management Practices (BMPs) are mitigation measures designed to reduce undesirable impacts to the environment. Incorporation of mitigation can typically result in a more efficient environmental review process, increased operating efficiency, reduced reclamation, and less environmental impacts (The Gold Book 2007).

Mitigation Objectives

1. **Use avoidance or relocation as the preferred strategy for reducing potential adverse effects.**
2. **Employ as much mitigation as possible during planning.**
3. **Minimize surface disturbance effects of operations and maintain the reclamation potential of the site through design, construction, and other practices/techniques.**
 - a. The total disturbance area would be kept to a minimum and located in an area that would reduce environmental impacts as much as possible. Surface disturbance would be co-located where feasible; locate sites using existing roads and previously disturbed sites unless it would cause or aggravate an erosion problem. Locate all linear facilities in the same trenches (or immediately parallel to), and at the same time.
 - b. Use two-track (primitive) roads whenever possible.
 - c. Access roads would be no wider than 18 feet and located in an area suitable for year-round use. The Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development: The Gold Book has further guidance for the design of roads, utilities, and oil and gas operations Best Management Practices.
 - d. Interim and final reclamation would occur as soon as possible following disturbance. Interim reclamation would be completed to within a few feet of facilities.
 - e. Whenever practical, bury utilities. Use ditch witches or wheel trenchers (versus back hoes) wherever practical for installation of buried lines to minimize disturbance area.
 - f. Vegetation would be removed only when necessary. Mowing vegetation is preferred.
 - g. The use of alternative techniques, for example, directional drilling, drilling multiple wells from the same pad, co-mingling, recompletion, using existing well pads, is encouraged to minimize surface impacts from oil and gas development.
 - h. Mechanized equipment use causing rutting to a depth greater than 4 inches would not be allowed.
4. **Reduce impacts to soil and water resources. Eliminate sources of ground water and surface water contamination.**
 - a. Operations would avoid sensitive resources including riparian areas, floodplains, waterbodies, and areas subject to erosion and soil degradation. Vehicle movement in sensitive areas would be confined to the smallest reasonable area. Off-road vehicle travel may be restricted.
 - b. Reduce erosion, soil loss, and impacts to water quality by diverting storm water and trapping sediment during activity with erosion/sedimentation control measures.
 - c. There would be no adverse impacts from well water discharge to soils; discharge water may need to be impounded, re-injected, or applied as beneficial use (if it contains less than 10,000 ppm TDS).
 - d. Produced water, reserve pits, and mud pits would be lined with an impermeable liner if site material is porous and not placed in fill material or in natural watercourses; pits may not be cut or trenched. Plastic liners must have a minimum 140 lb/in² burst strength, 30 lb tear strength, and be installed over material that won't tear or puncture the liner. Pits would be at least 50 % below ground level and designed to contain all material with a minimum of 2 feet freeboard.
 - e. Use pitless or closed-loop drilling technology. Dispose of drilling fluids, mud, and cuttings in approved disposal areas.
 - f. The pipeline must be tested for leaks prior to backfilling the trench. Pre-clean pipelines prior to hydrostatic testing.
 - g. Avoid well pad designs with cut or fill material in excess of 10 vertical feet.
 - h. Diesel fuel would not be used in fracking fluids that have the potential for drinking water contamination.
 - i. Activity may be restricted during wet or frozen conditions.
 - j. Surface casing would be installed through the Fox Hills Formation to protect domestic ground water sources from contamination.
 - k. No adverse changes in quality of receiving surface or ground waters would occur. Control sources of contamination to protect surface and ground water quality. See the **Monitoring Appendix** for specific guidelines (O and K).
 - l. Properly design (grade, sloped, drainage structures, placement, etc.), grade (only when necessary to correct erosion, rutting, comfort, and/or safety), and maintain roads and trails. Design roads to use sites with stable geology, well-drained soils, and natural benches; avoid erodible and low bearing strength soils. Roads would follow the contours of the terrain; avoid long, steep road grades. Road ditches would have flat bottoms and water turn-outs to prevent ditch erosion.

5. Manage Invasive Species

- a. The project area would be inventoried for invasive plants on/or adjacent to the site before initial activities.
- b. Develop an invasive species management plan or address invasive species in project level (implementation) environmental review.
- c. Control invasive species utilizing an integrated pest management approach.
- d. Do not allow invasive species to be transported offsite without appropriate disposal measures.
- e. Revegetate disturbed areas through seeding as needed to control erosion and reduce spread of weeds.
- f. Insure that soil stabilization material such as straw comes from weed free sources.

6. Reduce impacts to air resources

- a. Use alternative energy sources (e.g., solar and [or] wind power) on new water resource developments and convert power sources for existing water-well developments currently using generators on all BLM-administered lands where economically and physically feasible.
- b. Consider road surfacing to minimize erosion and impacts to air quality (e.g. pit-run gravel over scoria).

7. Develop and implement a mitigation monitoring and reporting strategy

- a. Conduct compliance and effectiveness monitoring in accordance with a BLM approved monitoring protocol. An on-site inspection by the BLM is required within one year of the disturbance. See **Soil Monitoring Appendix O** for specific guidelines.
- b. Evaluate monitoring data for compliance with the mitigation appendix.
- c. Document and report monitoring data. Recommend revised mitigation strategies where appropriate.
- d. Implement revised mitigation strategies where appropriate.
- e. Continue the process of monitoring, evaluating, documenting/reporting, and implementing, until mitigation goals are achieved.

Guidelines for Specific Activities

1. Waterbody Crossing Guidelines

- a. Stream crossings would be designed to minimize current and future impacts, including impedance of flow, and would not block, dam, or change any natural drainage.
- b. Multiple crossings would be avoided where possible.
- c. Site reclamation measures will be initiated as soon as a particular area is no longer needed for construction.
- d. Erodible material would not be placed in stream channel. Soil stockpiles would be located above the high water mark.
- e. Crossings would be designed at a right angle to the main channel.
- f. Design for adequate aquatic species passage.
- g. Timing of construction and adjustment of flow conditions may be required to accommodate aquatic species.
- h. Linear Facilities:
 - i. Perennial streams would be crossed using bore crossing (directional drill) or other methods as technology allows which would reduce erosion, sedimentation, and impacts to streambanks and riparian areas.
 - ii. Any water body with flowing water at the time of construction (including intermittent and ephemeral streams) would require an isolated crossing method such as bore crossing (directional drill) or open-cut dry crossing methods (e.g. dam-and-pump or flume methods) to reduce erosion and sedimentation. Diversion of stream flow would be required prior to and during trenching, backfilling, and compaction for open-cut crossing construction using an impermeable diversion and techniques to avoid erosion and sedimentation.
 - iii. Open-cut non-isolated (wet) crossings would not be allowed if the intermittent or ephemeral stream has any surface flow at any time during construction activities which includes trenching, backfilling, compaction, and re-stabilization.

2. Culverts (refer to The Gold Book for installation details)

- a. Install culverts to prevent erosion, scour, seepage, and failure.
- b. Install culverts to conform to the natural streambed and slope. Install culverts slightly below normal stream grade.
- c. Use drop structures, rock armor, downspouts, and energy dissipaters to reduce erosion, as long as this does not impede aquatic wildlife passage.
- d. Install culverts to ensure fish and aquatic wildlife passage in all fish-bearing streams. Culverts would follow any additional guidelines and requirements provided by the Field Office Biologist and/or BLM and in coordination and cooperation with the. Flat bottom or bottomless culverts are preferred for fish passage as they reduce velocity and can be bedded with the natural substrate so that it functions like a streambed.
- e. Culverts would extend at least 1-foot beyond the toe of slope.
- f. Perform work at low flow and divert flow to minimize erosion and turbidity.
- g. Maintain culverts and fill; protect inflow from plugging.

Appendix L

South Dakota Field Office Reclamation Guidelines and Abandoned Mine Actions

Introduction

Reclamation would be required for surface disturbing activities (BLM surface only) that disturb vegetation and/or mineral/soil resources. The reclamation of a site aims to set the perpetual course for the planned future condition of a site, including eventual ecosystem restoration by natural processes. Prior to a surface disturbing activity the site would be evaluated on a case-by-case basis, including an on-site assessment if necessary, and mitigation measures would be enacted where appropriate. Reclamation plans would be site-specific, project-specific, and incorporate the project's complexity, environmental concerns, and reclamation potential. This appendix gives guidance for appropriate reclamation planning prior to authorization and following surface disturbance. Refer also to the Soil and Water Mitigation Guidelines in Appendix K.

The reclamation plan would serve as a binding agreement between the BLM and project proponent(s); it would be included in the proposed action of the NEPA document. Plans would incorporate program or regulatory specific requirements for reclamation. Preparation and review of plans would be based on available information and techniques. Goals and objectives within the reclamation plan would be consistent with the land use plan and be reasonable, ecologically achievable, and measurable. The plan is considered complete when all the requirements described below have been addressed, the techniques to meet the requirements are described in detail, and the BLM approves the plan. This agreement must be periodically reviewed (including monitoring and reporting) and adapted as needed as conditions change or new information or technology becomes available. Reclamation is considered successful when all the requirements described below have been addressed on-site and the BLM approves the site following an on-site inspection.

Most landscapes can be reclaimed using established conventional reclamation methods. However, some areas have unique characteristics that make achieving all the reclamation requirements described in this appendix unrealistic, for example: sensitive soils, sensitive vegetation types, soils with severe physical or chemical limitations, steep slopes, etc. These limited reclamation potential areas may require site-specific reclamation measures not addressed in this appendix. Each project would develop a unique set of reclamation success requirements for those areas within the framework of this appendix. During the NEPA process, alternatives to approving development activities in such areas would be carefully analyzed. Alternatives considered would include: avoidance and/or unconventional site specific reclamation requirements. Resource development activities approved in these areas may require additional bonding.

Reclamation Goals

The short-term goal of the reclamation plan would include immediate stabilization of the disturbed area and to create the conditions needed for the long-term goal. Interim reclamation will be done if a site is to be left in a changed state for more than six months. The long-term goal of the reclamation plan is eventual ecosystem restoration by natural processes, this includes: a safe and stable landscape, while meeting desired conditions described in the land use plan.

Reclamation Objectives

The following reclamation guidelines apply to all surface disturbing activities, including BLM initiated activities, and must be addressed in each reclamation plan. These guidelines must be met prior to release of the bond and/or reclamation liability. Where these reclamation guidelines differ from more stringent,

applicable, laws, rules, and regulations, those standards replace this policy.

1. Manage all waste materials.

- a. The site would be cleaned of all equipment, structures, material, and debris.
- b. Surface pipelines/utility lines would be removed during final reclamation; deep lines (typically 3 feet or deeper) would be removed only if required by authorized officer.
- c. Segregate, treat, and/or bioremediate contaminated material. Free fluids must be removed. Waste material must be disposed of at a state approved facility.
- d. Bury only authorized (by BLM or state) waste materials on site. Buried material would be covered with a minimum of 5 feet of suitable material or meet other program standards. Buried material must meet the following criteria: range of pH 6-9, moisture content <50% by weight, oil and grease content <3% by weight, EC <12 mmhos/cm, unconfined compressive strength >20 lb/in², and the total metals content must not exceed EPA limits.

2. Ensure subsurface integrity and eliminate sources of ground and surface water contamination.

- a. Properly plug all drill holes and other subsurface openings and seal from the bottom to the top of water-bearing formations.
- b. Stabilize, properly back fill, cap, and/or restrict from entry all open shafts, underground workings, pits, and other openings.
- c. No adverse changes in quality of receiving surface or ground waters would occur. Control sources of contamination to protect surface and ground water quality. See the **Monitoring Appendix** for specific guidelines (O and K).
- d. Maintain all erosion or sedimentation control devices until vegetation is reestablished, site is stabilized, or are no longer needed.

Water Bar Guidelines

- 1) Water bars are required on 25% slopes or greater and will be used as necessary on gentler slopes. Vary water bar spacing to:
 - a) Fit site conditions
 - b) Promptly intercept surface water before the volume of water and velocity increase enough to generate erosion
 - c) Facilitate drainage toward natural dips, rocky ground, or vegetation to intercept sediment
- 2) Suggested spacing between water bars:

<i>Slope (%)</i>	<i>Spacing at Least Every (Feet)</i>
<10	100-400
10-19	75-200
20-39	50
>39	25

- 3) Water bars would:
 - a) Be 4-6 inches high but can be deeper depending on site conditions.
 - b) Be at a 20° angle to the slope and channel water to the downhill side.
 - c) Avoid pushing sediment into streams, draws, or coulees.
 - d) Be placed to intercept runoff before channelization can occur (specifically the first water bar at the top of the slope).
- 4) The Gold Book (Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, 4th edition, 2007) has further guidance and cross-sectional diagrams, including standards for water dips that are drivable.
- 5) Fertilizer and soil additives would not be applied where they could adversely impact water quality.

3. Re-establish slope stability, surface stability, and desired topographic diversity.

- a. Reconstruct the landscape to the approximate original contour and to blend with adjacent contours. However, if the site has stabilized and recontouring would cause additional disturbance, this step may not be necessary and could be waived by the authorized officer.
- b. Maximize geomorphic stability and topographic diversity of the reclaimed topography.
- c. Disturbed areas would be recontoured to provide proper drainage.
- d. Eliminate highwalls, cut slopes, and/or topographic depressions on site; unless otherwise approved.
- e. Backfill to prevent surface subsidence. No downward movement of surface material would be evident, maintain to correct settling. See the **Monitoring Appendix** for specific guidelines (O and K).
- f. There would be no evidence of slope instability on/or adjacent to the site other than minimal sheet or rill erosion. Minimize accelerated erosion/sedimentation on/or adjacent to the reclaimed area with appropriate erosion/sedimentation control measures immediately following disturbance. See the **Monitoring Appendix** for specific guidelines (O and K).
- g. Reclaim all roads and trails unless they meet public demand.
- h. The Burned Area Emergency Stabilization and Rehabilitation Handbook (BLM handbook H-1742-1 2007) has further guidance on erosion/sedimentation control Best Management Practices.

4. Reconstruct and stabilize water courses and drainage features.

- a. Reconstruct drainage basins and reclaim impoundments to maintain the drainage pattern, profile, and dimension to approximate the natural features found in the sites naturally functioning basin or nearby, similar reference basins if appropriate.
- b. Reconstruct and stabilize stream channels, drainages, and impoundments to exhibit similar hydrologic characteristics found in the sites naturally functioning system or nearby, similar reference systems if appropriate.
- c. Upland erosion from surface disturbing activities must be controlled effectively and not be allowed to be transported to stream systems.

5. Maintain the biological, chemical, and physical integrity of the soil resource.

- a. Identify, delineate, and segregate all salvaged topsoil and subsoil based on a site-specific and project-specific soil evaluation.
- b. Soil would be direct hauled to similar sites in the process of reclamation whenever possible. If that's not possible, topsoil would be stockpiled separately from subsoil. Identify stockpiles with appropriate signage.
- c. Protect all stored soil material from erosion, degradation, and contamination. Stockpiles would be no more than 8-feet deep and of a stable configuration. Stockpiles would be located away from riparian areas, floodplains, wetlands, and other sensitive areas. Erosion control and seeding would be applied to the stockpile within 30 days of storage. ROW and road stockpiles for oil and gas pads would be stored near the cut/fill site.
- d. Incorporate stored soil material into the disturbed landscape.
- e. Displaced farmland, in production or not, would be reclaimed to original productivity. See the **Monitoring Appendix** for specific guidelines (O and K).
- f. Soils which were naturally barren before disturbances would be evaluated for reclamation by recontouring the surface to blend in with the topography and then compacting the reconstructed surface to 100% bulk density, rather than using trying to seed and vegetate the site.

6. Prepare site for revegetation.

- a. Redistribute soil resources in a manner similar to the original vertical profile.
- b. Reduce subsoil compaction to a minimum of 4 inches below the compacted root zone prior to redistribution of topsoil to accommodate desired plant species.

- c. Provide suitable surface and subsurface physical, chemical, and biological properties to support the long-term establishment and viability of the desired plant community as soon as possible following disturbance.
- d. Remedial reclamation techniques would be evaluated and used to reclaim sites which were originally vegetated, but were badly impacted by poor techniques and practices used in disturbing the soil to develop a project. In such cases this can result in inadequate topsoil quantity, degraded topsoil, and increased problems with high erodibility, low water holding capacity, sodicity in soils, and salinity in soils. These remedial efforts would be made so that the site again supports ecosystem values, as well as the potential for economic use.
- e. Soil amendments would be evaluated for use including forms of organic matter, such as wood chips, manure, sawmill waste, etc. Methods such as hydroseeding, the use of matting, etc., would be evaluated for use. Chemical amendments would be evaluated for use such as iron sulfide, calcium chloride, magnesium chloride, calcium sulfate, etc., to physically change soil properties, which would result in the ability to support adequate vegetation.

7. Establish a desired, self-perpetuating, native plant community.

- a. Establish species composition, diversity, structure, and total ground cover appropriate for the desired plant community as soon as possible following disturbance. Within 5 years of disturbance, the site would contain a minimum of 80% of the vegetative cover as compared to the reference site or NRCS Ecological Site Description (<http://www.mt.nrcs.usda.gov/technical/ecs/range/ecosites/>), whichever is appropriate. Within 5 years of the disturbance, 90% of the vegetative cover would consist of desirable species. Multiple treatments may be required before success is achieved. Monocultures would not be allowed. See the **Monitoring Appendix** for specific guidelines (O and K).
- b. Select genetically appropriate and locally adapted native plant materials based on the site characteristics and ecological setting whenever possible, using NRCS ecological sites and soil surveys. If local seed is required it must be collected in the wild. Stream banks would be replanted with riparian vegetation following current ecological restoration practices.
- c. Native species are preferred; select non-native plants only as an approved short-term, non-persistent, alternative to native plant materials (BLM handbook 1740-2 and Executive Order 13112). Ensure the non-native species will not hybridize, displace, or offer long-term competition to the endemic plants, and are designed to aid in the re-establishment of native plant communities. Native species are required for projects with the subactivities 1110 (wildlife management), 1120 (fisheries), or 1150 (threatened and endangered species).
- d. Seed sites as soon as possible following re-contouring and seed-bed preparation and when environmental conditions are appropriate. Approved seed rates would be specified in pounds of pure live seed (PLS) per acre and be designed to adequately cover the soil upon germination. Seed must be tested to ensure viability and purity (germination or TZ tested by a registered seed analyst within 1 year of receipt). Seed must be certified weed-free (WO IM No. 2006-073 and BLM handbook H-1742-1 and BLM handbook H-1740-2). Commercial seed must have documentation (not seed bag tags) easily accessible, including sources.
- e. Drill or broadcast seed along contours. Drill seed with a 6 inch row spacing, ½ to ¾ inches deep.
- f. The recommended drill seeding rate for large seeded species is 20 PLS/ ft². The recommended drill seeding rate for small seeded species (most BLM seed mixes) is 30-40 PLS/ ft². Broadcast or aerial seedings are recommended at the rate of 60-80 PLS/ ft² (approx. double the drilled rate); not to exceed 80 PLS/ ft².
- g. Seed additives are allowed (e.g. rhizobium, mycorrhiza, fungicide, pilling).
- h. Protect seed and seedling establishment with appropriate measures. Erosion control matting and mulch must be certified weed/insect-free in accordance with the State's Department of Agriculture laws and requirements, the Federal Seed Act, and specification JJJ-181. Fencing to prohibit cattle and/or wildlife may be necessary.
- i. The Burned Area Emergency Stabilization and Rehabilitation Handbook (BLM handbook H-1742-1), the Integrated Vegetation Management handbook (H-1740-2)

and www.nativeseednetwork.org have further guidance on revegetation Best Management Practices.

8. Reestablish complementary visual composition.

- a. Ensure the reclaimed landscape features blend into the adjacent area and conform to land use plan decisions (BLM Handbook H-8431).
- b. Ensure the reclaimed landscape does not result in a long-term change to the scenic quality of the area; therefore the Scenic Quality Rating would not change (BLM Handbook H-840).

9. Manage Invasive Species

- a. Develop an invasive species management plan if appropriate.
- b. Control invasive species utilizing an integrated pest management approach.
- c. Do not allow invasive species to be transported offsite without appropriate disposal measures.

10. Develop and implement a reclamation monitoring and reporting strategy.

- a. Conduct compliance and effectiveness monitoring in accordance with a BLM approved monitoring protocol. Observations must include erosion/sedimentation, revegetation, and invasive species. An on-site inspection by the BLM is required within one year of the interim and final reclamation. See the Monitoring Appendix for specific guidelines (O and K).
- b. Evaluate monitoring data for compliance with the reclamation plan.
- c. Document and report monitoring data. Recommend revised reclamation strategies where appropriate.
- d. Implement revised reclamation strategies where appropriate.
- e. Continue the process of monitoring, evaluating, documenting/reporting, and implementing, until reclamation goals are achieved.

Abandoned Mine Lands (AML): Management Actions to the Public Safety Program

To the extent possible on SDFO public lands, the BLM will:

- a. Reclaim AML sites to improve water quality, plant communities, and diverse fish and wildlife habitat;
- b. Reduce and/or eliminate risks to human health from hazardous mine openings, with consideration for preservation as bat habitat; and
- c. Protect historic resources and wildlife habitat commonly associated with AML sites.
- d. Strive to meet state and federal water quality standards in watersheds impacted by historic mining.
- e. Assess the level of risks at AML sites and prioritize for reclamation based on standardized risk assessment. Reclamation would be implemented at the highest risk sites first.
- f. Restore severely impacted soils and watersheds that support productive plant communities as closely as possible to pre-disturbed conditions and ensure properly functioning watersheds (where deemed appropriate by BLM personnel).
- g. Design closures of dangerous inactive and abandoned mine sites to reduce the risks to human health and safety, restore the environment, and protect geological and cultural resources and meet or move toward meeting Land Health Standards.
- h. Monitor restoration and reclamation activities and repositories to determine effectiveness of reclamation practices. Repositories would be maintained to assure cap integrity, including maintaining vegetation for stability, yet preventing tree growth to forestall root penetration of the cap.
- i. Conduct operation, maintenance, and evaluation activities to ensure the effectiveness of the selected remediation.
- j. Strive to meet state and federal air quality standards in the interest of protecting human health

- potentially impacted by fugitive dust emissions.
- k. Require all resource activities to reclaim and restore AML or hazard reduction sites to the extent necessary to protect work performed on the site.

Appendix M

South Dakota Field Office Grazing Allotment Allocations

Livestock would be allocated between approximately 73,400 animal unit months (AUMs) and 77,300 AUMs of forage each year from BLM land in the planning area. The current livestock allocations for the planning area are shown in the table below. All of the leases listed are Section 15 grazing leases except for certain leases with Allotments that span across state boundaries from South Dakota into Montana or Wyoming.

<i>Allotment Number</i>	<i>Allotment Name</i>	<i>Allotment Category</i>	<i>Public Acres</i>	<i>Public AUMs</i>	<i>Livestock Class</i>	<i>County</i>
01221	RIDGE	I	101	27	CATTLE	HARDING
02206	PINE CREEK	I	4374	1177	CATTLE	MEADE
02214	WHIMMER WHAMMER	I	4846	1470	CATTLE	MEADE
02215	PEDRO	I	2097	699	CATTLE	PENNINGTON
02223	BULL CREEK	I	1125	236	CATTLE	MEADE
02308	WILLOW CR. LATERIAL	I	400	126	CATTLE	BUTTE
02401	FLAT TOP	I	4440	1246	CATTLE & SHEEP	BUTTE
02402	BEAN BLOSSOM CREEK	I	1382	328	SHEEP	BUTTE
02403	SEIM RANCH EAST	I	2424	668	SHEEP	BUTTE
02409	OPOSIUM HOLLOW	I	2935	790	CATTLE & SHEEP	BUTTE
02413	E. CROOKED CREEK	I	737	181	SHEEP	BUTTE
02419	UPPER ALKALI	I	720	178	SHEEP	HARDING
02432	SHORT CREEK	I	1931	449	CATTLE	BUTTE
02438	FOWLER	I	940	194	CATTLE	BUTTE
02443	JEEP TRAIL	I	1669	355	CATTLE	BUTTE
02457	BIRD	I	120	24	CATTLE	PERKINS
02473	SEIM RANCH WEST	I	2094	618	CATTLE	BUTTE
03221	WHITEWOOD CREEK	I	258	60	CATTLE	LAWRENCE
07213	TOWN SITE	I	665	84	CATTLE	FALL RIVER
07235	WATAWA-EAST	I	1181	380	CATTLE	BUTTE
07268	BADLANDS	I	2779	499	CATTLE	PENNINGTON, MEADE
01740	SPUR CREEK	M	1215	361	CATTLE & SHEEP	BUTTE
01756	CROCKETT MOUNTAINS	M	2459	796	CATTLE	STANLEY
01759	FOSTER CREEK	M	1252	439	CATTLE	STANLEY
01794	BUFFALO CREEK	M	1200	311	SHEEP	HARDING
02205	E. BADLANDS	M	1200	206	CATTLE	MEADE
02213	HILL TOP	M	482	168	CATTLE	PENNINGTON
02220	BOURNE DRAW	M	1608	546	CATTLE	PENNINGTON
02224	DEEP CREEK	M	487	179	CATTLE	PENNINGTON
02225	DEEP CREEK	M	480	172	CATTLE	PENNINGTON
02226	WHEAT DRAW	M	720	234	CATTLE	PENNINGTON
02228	FOURMILE	M	2020	505	CATTLE	BUTTE
02301	B. FOURCHE RIVER	M	1222	379	CATTLE	BUTTE,

<i>Allotment Number</i>	<i>Allotment Name</i>	<i>Allotment Category</i>	<i>Public Acres</i>	<i>Public AUMs</i>	<i>Livestock Class</i>	<i>County</i>
						MEADE
02302	TOWER	M	4836	1458	CATTLE	BUTTE
02304	BUTTE CREEK	M	1000	302	CATTLE	BUTTE
02309	WILLOW	M	680	210	CATTLE	BUTTE
02310	FOUR MILE CREEK	M	2241	698	CATTLE & SHEEP	BUTTE
02311	WATTAWA-WEST	M	880	188	CATTLE	BUTTE
02404	FROZEN HORSE	M	4603	1105	SHEEP	BUTTE
02407	CRAGO	M	10392	3216	CATTLE	BUTTE
02408	WATSON DRAW	M	387	117	CATTLE	BUTTE
02410	ROCKY BUTTE	M	748	205	CATTLE	BUTTE
02411	HOEYE	M	1640	516	CATTLE	BUTTE
02417	PORCUPINE CR.	M	9781	2465	CATTLE & SHEEP	BUTTE
02420	HITZEL	M	981	237	CATTLE	BUTTE
02421	TWO TOP	M	1284	272	CATTLE	BUTTE
02424	JONES/MUD BUTTE	M	981	306	CATTLE	BUTTE
02425	S.F. MOREAU	M	1240	351	CATTLE & SHEEP	HARDING
02430	T.T. BUTTE	M	4154	1018	CATTLE	BUTTE
02433	WATSON DRAW	M	2431	505	CATTLE	BUTTE
02435	MOREAU	M	19710	4768	CATTLE & SHEEP	BUTTE, HARDING
02439	2-TOP	M	845	143	CATTLE	BUTTE
02440	REID	M	755	163	CATTLE & HORSES	BUTTE
02444	BATTLE CREEK	M	1749	478	CATTLE	BUTTE
02446	GREASEWOOD	M	1347	370	SHEEP	BUTTE
02447	SOUTH INDIAN	M	720	163	CATTLE & SHEEP	BUTTE
02448	NORTH BUTTE	M	7978	1969	CATTLE, SHEEP & HORSES	BUTTE
02450	PERSCHE	M	723	225	CATTLE	BUTTE
02460	ANTELOPE CREEK	M	5534	1541	CATTLE	BUTTE
02470	CUT BLADE	M	1960	404	CATTLE	BUTTE
02491	ALKALI	M	996	252	SHEEP	HARDING
02495	TRUSSMAN	M	320	100	CATTLE	MEADE
02496	LOWER ELM CREEK	M	1360	402	CATTLE	BUTTE
02501	FT MEADE	M	2790	562	CATTLE	MEADE
02502	BEAR BUTTE	M	2990	1261	CATTLE	MEADE
02703	HUDDLESTON CREEK	M	501	131	CATTLE	MEADE
02723	ELM CREEK	M	2702	851	CATTLE	MEADE
02763	ORTON FLAT	M	719	90	CATTLE	STANLEY
02771	PLEASANT VALLEY	M	1977	229	CATTLE	HARDING
02780	JUMP OFF	M	1951	462	CATTLE & SHEEP	HARDING

<i>Allotment Number</i>	<i>Allotment Name</i>	<i>Allotment Category</i>	<i>Public Acres</i>	<i>Public AUMs</i>	<i>Livestock Class</i>	<i>County</i>
03222	HILDERBRAND	M	1760	407	CATTLE	BUTTE
07222	IRON POST BUTTES	M	800	266	CATTLE	STANLEY
07252	T.Y.	M	520	82	CATTLE	FALL RIVER
07253	S. WILLOW CREEK	M	960	190	CATTLE & BISON	BUTTE
07332	RAMEY	M	1442	329	CATTLE	BUTTE
10234	INDIAN CREEK	M	136	60	CATTLE	BUTTE
00816	L/E FOX	C	160	44	CATTLE & SHEEP	HARDING
00825	FOX RANCH	C	160	48	CATTLE	HARDING
00924	FERGUSON	C	1440	384	CATTLE	HAAKON
00929	BUCK	C	40	14	CATTLE	BUTTE
00931	HAYSTACK BUTTE	C	996	302	CATTLE	BUTTE
00932	CLOUD	C	160	43	CATTLE	HARDING
00949	BERDAN	C	200	70	CATTLE	PENNINGTON
00954	PAINTED HORSE	C	200	59	CATTLE	STANLEY
00971	COOK	C	600	171	CATTLE	BUTTE
00996	LINER	C	240	81	CATTLE	PENNINGTON
00997	GOVERNMENT DRAW	C	80	26	CATTLE	STANLEY
01701	HERD CAMP	C	280	87	CATTLE	STANLEY
01702	BEAVER DAM	C	1413	230	CATTLE & SHEEP	HARDING
01703	OWL BUTTE	C	608	203	CATTLE	BUTTE
01704	WOLF SPRING CREEK	C	916	230	CATTLE	PERKINS
01705	LODGEPOLE	C	40	14	CATTLE	HARDING
01706	MAGPIE	C	160	44	CATTLE	BUTTE
01707	CAMPBELL CREEK	C	76	19	CATTLE	HARDING
01708	MOREAU RIVER RANCH	C	40	12	CATTLE	BUTTE
01709	DOUBLE R	C	443	157	CATTLE	BUTTE
01710	HAY CREEK	C	80	22	CATTLE & SHEEP	BUTTE
01711	MCKENZIE BUTTE	C	240	72	CATTLE & SHEEP	HARDING
01712	COTTONWOOD	C	80	22	CATTLE	HARDING
01713	BRUSH CREEK WEST	C	240	56	CATTLE & SHEEP	HARDING
01714	DEER RUN	C	480	160	CATTLE	
01715	BLUE SKY	C	160	44	CATTLE	BUTTE
01716	L. MISSOURI RIVER	C	200	50	CATTLE	HARDING
01717	JOHNNY CREEK	C	40	12	CATTLE	MEADE
01718	MAVERICK JUNCTION	C	80	10	CATTLE	FALL RIVER
01719	BRIDGER CREEK	C	80	27	CATTLE	HARDING
01720	SE OWL CREEK	C	196	74	CATTLE	BUTTE
01721	SADDLE BUTTE	C	120	41	CATTLE	HARDING
01722	HAWK CREEK	C	440	152	SHEEP	HARDING
01723	CLARKS FORK	C	148	34	CATTLE	HARDING
01725	JONES CREEK	C	560	178	CATTLE	HARDING

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01726	TABLE TOP	C	23	8	CATTLE	BUTTE
01727	SF JUMPOFF	C	40	12	CATTLE	HARDING
01728	LITTLE MISSOURI	C	222	47	CATTLE	HARDING
01729	FOOTHILLS	C	232	73	CATTLE	CUSTER
01730	HATCHET RANCH	C	40	11	CATTLE & HORSES	CUSTER
01731	LARIAT	C	787	247	BISON	STANLEY
01732	TWIN FLOWER	C	279	83	CATTLE	PERKINS
01733	BUNCHGRASS	C	40	14	CATTLE	MEADE
01734	ARNETT CREEK	C	335	83	CATTLE	HARDING
01735	BOYDSON DRAW	C	640	230	CATTLE	MEADE
01736	HERFORD	C	600	191	CATTLE	MEADE
01737	FAIRPOINT	C	40	12	CATTLE	MEADE
01738	NORTH CANAL	C	40	13	SHEEP	BUTTE
01739	SOUTH TABLE TOP	C	329	115	CATTLE	BUTTE
01741	BLUEBIRD	C	280	73	CATTLE & SHEEP	PERKINS
01742	DOGIE CREEK	C	518	126	BISON	HARDING
01743	PETES CREEK	C	80	25	CATTLE	HARDING
01744	ARROWHEAD BUTTE	C	160	39	CATTLE	PERKINS
01745	WOLF SPRINGS CREEK	C	80	16	CATTLE	PERKINS
01746	LAUZON	C	234	42	CATTLE	CUSTER
01747	COTTONWOOD	C	160	25	CATTLE	FALL RIVER
01748	ELM SPRINGS	C	120	29	CATTLE	MEADE
01749	LITTLE CANYON	C	133	42	CATTLE	PENNINGTON
01750	STANDING BUTTE	C	320	85	CATTLE	STANLEY
01751	HAWK CREEK	C	160	12	CATTLE & SHEEP	HARDING
01752	TRIPLE TWO	C	120	33	CATTLE & SHEEP	MEADE
01753	WHITEWOOD	C	40	7	CATTLE	LAWRENCE
01754	SKULL CREEK	C	80	27	CATTLE	HARDING
01755	SHEEP MOUNTAIN	C	440	143	CATTLE & SHEEP	HARDING
01757	WHEAT FARM	C	120	35	CATTLE	BUTTE
01758	HAYSACK BUTTES	C	360	112	CATTLE	BUTTE
01760	OAHE	C	240	82	CATTLE	STANLEY
01761	ELM TREE DRAW	C	40	13	CATTLE	HAAKON
01762	FOUR CORNERS	C	40	14	CATTLE	MEADE
01763	HOOVER	C	720	188	CATTLE & SHEEP	HARDING, BUTTE
01764	CHIMNEY BUTTE	C	360	95	CATTLE	HARDING
01765	CROOKED CREEK	C	80	24	SHEEP	HARDING
01766	NORTH MACY	C	401	95	CATTLE & SHEEP	BUTTE
01767	STATION ELM	C	654	189	CATTLE	BUTTE
01768	BIG NASTY CREEK	C	40	13	CATTLE	HARDING

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01769	MUD ELM	C	185	58	CATTLE	BUTTE
01770	HARDING CREEK	C	40	14	CATTLE	HAAKON
01771	C. RIVER	C	52	17	CATTLE	PENNINGTON
01772	HUGHES	C	120	38	CATTLE	MEADE
01773	DODGE DRAW	C	120	38	CATTLE & SHEEP	HARDING
01774	WILLOW CREEK	C	194	53	CATTLE	STANLEY
01775	DRY FOUR MILE	C	40	3	CATTLE	MEADE
01776	BURDOCK	C	280	48	CATTLE	FALL RIVER
01777	BIG CANYON	C	280	70	CATTLE	PENNINGTON
01779	ALKALI ROAD	C	320	114	CATTLE	MEADE
01780	SOUTH HWY	C	280	81	CATTLE	HARDING
01781	LANCE CREEK	C	80	26	CATTLE	STANLEY
01782	THREE TREE DRAW	C	80	20	CATTLE	PENNINGTON
01783	BENTON STRIP	C	80	6	CATTLE	BUTTE
01784	WEST BRANCH	C	40	12	CATTLE	MEADE
01785	FAULKNER	C	40	12	CATTLE	HARDING
01786	WILLOW CREEK	C	160	48	CATTLE	BUTTE
01787	RED OWL CREEK	C	104	34	CATTLE	MEADE
01788	OWL CREEK	C	240	38	CATTLE	BUTTE
01789	EDGEMONT	C	120	19	CATTLE	FALL RIVER
01790	FOSSIL CYCAD	C	320	97	CATTLE	FALL RIVER
01791	SECTION 24	C	120	14	CATTLE	CUSTER
01792	CLARKS FORK	C	400	115	CATTLE	HARDING
01795	RIDGE	C	80	22	CATTLE	BUTTE
01796	DEADHORSE CANYON	C	280	81	CATTLE	FALL RIVER
01797	DANBURY	C	80	20	CATTLE	PENNINGTON
01798	CEDAR CANYON	C	520	124	CATTLE	PERKINS
01799	PONY	C	494	166	CATTLE	MEADE
01800	BOG CREEK	C	40	10	CATTLE	HARDING
02200	AGENCY CREEK	C	280	112	CATTLE	STANLEY
02201	HALFMOON	C	918	247	CATTLE	PENNINGTON
02203	HILL	C	640	215	SHEEP	BUTTE
02204	POVERTY POINT	C	137	43	CATTLE	MEADE
02207	SAGE	C	720	203	CATTLE	MEADE
02208	HAMMANN LAKE	C	40	13	CATTLE	PENNINGTON
02209	BOURNE DRAW	C	520	171	CATTLE	PENNINGTON
02211	GUNSMOKE	C	680	222	CATTLE	PENNINGTON
02212	MUD BUTTE	C	120	32	CATTLE	MEADE
02216	MIXES FOOD CREEK	C	1040	377	CATTLE	PENNINGTON
02217	EAST KILLDEER	C	560	173	CATTLE	MEADE
02218	POISON WEED	C	3557	1148	CATTLE	PENNINGTON
02219	RIVER FLAT	C	280	73	CATTLE	MEADE
02221	WEST TEPEE CREEK	C	80	49	CATTLE	MEADE
02227	BATTLE MTN	C	80	16	CATTLE	FALL RIVER
02303	COOK	C	520	179	SHEEP	BUTTE

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02305	JUG CREEK	C	200	70	CATTLE & SHEEP	BUTTE
02306	EIGHTMILE	C	150	50	CATTLE	BUTTE
02307	TIMM-NORTH	C	402	139	CATTLE	BUTTE
02405	SHORT PINE	C	840	209	CATTLE & SHEEP	HARDING
02406	COLLINS PLACE	C	480	120	CATTLE	HARDING
02412	ARPAN ROAD	C	40	7	CATTLE	BUTTE
02414	FOX	C	1159	396	CATTLE & SHEEP	BUTTE, HARDING
02415	STATELINE	C	75	20	CATTLE	BUTTE
02418	INDIAN CREEK	C	470	116	CATTLE	BUTTE
02422	HT	C	650	186	SHEEP	BUTTE
02423	FLAT ROCK	C	80	24	CATTLE	BUTTE
02426	MACY	C	920	276	CATTLE & SHEEP	BUTTE
02428	OWL CREEK	C	580	107	CATTLE	BUTTE
02429	DUNN-BURKE	C	591	144	CATTLE & SHEEP	BUTTE
02431	N. INDIAN CR.	C	97	26	CATTLE	BUTTE
02434	GUIDINGER	C	960	140	CATTLE	BUTTE
02436	HORSE CREEK EAST	C	405	120	CATTLE	BUTTE
02441	WELFRING	C	120	36	CATTLE	BUTTE
02442	RONNING DRAW	C	916	205	CATTLE & SHEEP	BUTTE
02445	SPOKE	C	621	172	CATTLE & SHEEP	BUTTE
02449	WILLOW CREEK	C	160	44	CATTLE	BUTTE
02451	LONETREE CR.	C	40	15	CATTLE	BUTTE
02452	MIDDLE CREEK	C	80	20	CATTLE	BUTTE
02453	TIMBER CREEK	C	800	240	CATTLE	MEADE
02454	HORSE CR.	C	156	54	CATTLE	BUTTE
02456	BREAKNECK HILL	C	40	8	CATTLE	FALL RIVER
02471	HOVERMALE	C	40	5	CATTLE	CUSTER
02472	TWIN EIGHTY	C	160	53	CATTLE	MEADE
02478	HOME RANCH EAST	C	200	50	SHEEP	BUTTE
02492	TWENTYONE DIVIDE	C	80	20	CATTLE	FALL RIVER
02493	WOLF SPRING CREEK	C	120	34	CATTLE	PERKINS
02494	RADIO TOWER	C	40	11	CATTLE	HARDING
02497	RANCHSIDE	C	280	79	CATTLE	MEADE
02498	DUCK CREEK	C	144	59	CATTLE	HARDING
02499	FROG CREEK	C	480	150	SHEEP	BUTTE
02604	TORNADO (RIFLE RANGE)	C	275	92	CATTLE	LAWRENCE
02610	LEXINGTON HILL	C	357	40	CATTLE	LAWRENCE
02625	SHEEPTAIL GULCH	C	8	32	HORSES	LAWRENCE
02700	ELM CREEK	C	80	26	CATTLE	BUTTE

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02701	EIGHTMILE CREEK	C	80	28	CATTLE & SHEEP	BUTTE
02702	DRAW CREEK	C	40	8	CATTLE	BUTTE
02704	SOUTH SULPHUR CREEK	C	720	247	SHEEP	BUTTE
02705	COW CREEK	C	320	63	CATTLE	PENNINGTON
02706	BAD RIVER	C	615	195	BISON	STANLEY
02707	MADISON CREEK	C	101	28	CATTLE	PENNINGTON
02708	RABBIT BUTTE	C	40	13	CATTLE	PERKINS
02709	HACKAMORE	C	400	120	CATTLE	HARDING
02710	BRUSH CREEK	C	350	99	CATTLE	HARDING
02711	RED CANYON	C	79	24	CATTLE	FALL RIVER
02712	ROCK CREEK	C	80	27	CATTLE	MEADE
02713	SPOKE	C	21	7	CATTLE	HARDING
02714	PALMER DRAW	C	320	88	CATTLE	BUTTE
02715	RECEPTION	C	200	63	CATTLE	MEADE, PENNINGTON
02716	SULPHUR CREEK	C	120	36	CATTLE	MEADE
02717	BUCK PASTURE	C	654	197	CATTLE	BUTTE
02718	BONEITA SPRINGS	C	719	215	CATTLE	MEADE
02719	FLINT ROCK	C	240	79	CATTLE	PERKINS
02720	OFF CENTER	C	1128	343	CATTLE	BUTTE
02721	POLE	C	880	150	CATTLE	BUTTE
02722	OWANKA	C	40	12	CATTLE	PENNINGTON
02724	W. ELM CREEK	C	240	58	CATTLE	BUTTE, MEADE
02725	BROKEN BOOT	C	160	48	CATTLE	PENNINGTON
02726	DALZELL CANYON	C	583	196	CATTLE	PENNINGTON
02727	SOFT WATER	C	120	40	CATTLE	MEADE
02728	SOFT WATER	C	40	12	CATTLE & SHEEP	HARDING
02729	BRUSHY	C	80	18	CATTLE	PERKINS
02730	MISSION RIDGE	C	734	247	CATTLE	STANLEY
02731	BADLANDS	C	160	8	CATTLE	PERKINS
02732	FROZEN MAN	C	40	12	CATTLE	MEADE
02733	ELM CREEK	C	1008	181	CATTLE & HORSES	FALL RIVER
02735	BREAKS	C	70	20	CATTLE	STANLEY
02736	BRANDING IRON	C	1040	335	BISON	STANLEY
02737	ALKALI ROAD	C	440	146	CATTLE	MEADE
02738	LITTLE MISSOURI	C	40	13	CATTLE & SHEEP	HARDING
02739	SORGHUM FLAT	C	110	18	HORSES	FALL RIVER
02740	BIG BUCK	C	40	7	CATTLE	LAWRENCE
02741	MNSD	C	440	100	SHEEP	HARDING
02742	CROW CREEK	C	177	49	CATTLE	BUTTE
02743	HOME PLACE	C	40	11	SHEEP	HARDING

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02744	ROUND-UP	C	240	70	CATTLE & SHEEP	BUTTE
02745	SOUTH HAYSTACK BUTTE	C	320	82	CATTLE	BUTTE
02746	NORTH COWBOY	C	40	10	CATTLE	HARDING
02747	ANDERSON DRAW	C	77	23	CATTLE	PENNINGTON
02748	WILLOW CREEK	C	360	90	CATTLE	BUTTE
02749	MISSION CREEK	C	1160	355	CATTLE	STANLEY
02750	BIXBY CAMP	C	360	105	CATTLE	PERKINS
02751	DUNN	C	40	12	CATTLE & SHEEP	BUTTE, HARDING
02752	JACK RABBIT	C	240	78	CATTLE	MEADE
02753	CROW CREEK	C	530	177	CATTLE	BUTTE
02754	GEIGLE	C	491	168	CATTLE	PENNINGTON
02755	SULPHUR BUTTE	C	600	166	CATTLE & SHEEP	BUTTE
02756	WAGON CREEK	C	133	38	CATTLE	HARDING
02757	WAGON CREEK NORTH	C	77	20	CATTLE	HARDING
02758	SHANTY BREAKS	C	160	53	CATTLE	HAAKON
02759	SOUTH CREEK	C	160	53	CATTLE	HAAKON
02760	SHARPTAIL	C	200	69	CATTLE	MEADE
02761	STARVE OUT CREEK	C	80	17	CATTLE	PERKINS
02762	TRIBUTARY	C	521	104	CATTLE	BUTTE
02764	FINGER RIDGES	C	160	54	CATTLE	MEADE
02765	NASTY CREEK	C	40	11	SHEEP	HARDING
02766	FLINT ROCK	C	80	27	CATTLE	PERKINS
02767	FAULKNER CREEK	C	320	72	CATTLE	HARDING
02768	ELM CREEK	C	982	290	CATTLE	BUTTE
02769	HANS CREEK	C	440	140	CATTLE	BUTTE
02772	SOUTH SULFUR CREEK	C	600	209	CATTLE	BUTTE
02773	HAWK CANYON	C	80	28	CATTLE	PENNINGTON
02774	JACK CREEK	C	80	24	SHEEP	HARDING
02775	FALL RIVER	C	40	6	CATTLE	FALL RIVER
02776	SLY FOX	C	660	186	CATTLE	PERKINS
02777	PLUM	C	160	48	CATTLE	STANLEY
02778	RED BUTTE	C	280	84	BISON	HARDING
02779	WILDCAT	C	438	124	CATTLE	BUTTE
02781	LUIS CREEK	C	209	74	CATTLE	HAAKON
02782	SECTION 34	C	80	29	CATTLE	BUTTE
02783	COUNTY LINE	C	240	48	CATTLE	FALL RIVER
02784	SAND DRAW	C	301	72	CATTLE	MEADE, PENNINGTON
02785	S. GRAND RIVER	C	359	76	CATTLE & BISON	HARDING
02787	MILESVILLE	C	80	26	CATTLE	HAAKON
02788	N. SLICK CREEK	C	40	9	CATTLE	HARDING

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02789	SWAN DRAW	C	473	139	CATTLE & HORSES	PERKINS
02790	CLARKS FORK	C	160	49	CATTLE & SHEEP	HARDING
02791	RIVER	C	480	84	HORSES	FALL RIVER
02792	SF GRAND RIVER	C	160	43	CATTLE	HARDING
02794	GRIZZ	C	80	24	CATTLE	HARDING
02795	PROFILE BUTTE	C	234	57	CATTLE	HARDING
02796	LITTLE COWBOY CREEK	C	360	121	CATTLE	HARDING
02797	SF GRAND	C	120	41	CATTLE & HORSES	HARDING
02798	ROUNDTOP	C	400	130	CATTLE	STANLEY
02799	WRANGLER	C	309	44	CATTLE	HARDING
02804	MISSOURI	C	280	69	CATTLE	BRULE
02805	BIJOU	C	200	50	CATTLE	BRULE
02806	BENCHMARK	C	80	25	CATTLE	MEADE
03089	FORK DAM	C	280	78	CATTLE	BUTTE
03119	RUMFORD	C	80	8	CATTLE	FALL RIVER
03134	BREAKS	C	396	132	CATTLE	HAAKON
03175	BC	C	160	38	CATTLE	BUTTE
03183	COUNTY CORNER	C	80	26	CATTLE	BUTTE
03200	LINDSAY BUTTE	C	753	252	CATTLE	STANLEY
03201	BRUSH CREEK	C	520	157	CATTLE	STANLEY
03202	SCHOEPP FLAT	C	280	93	CATTLE	BUTTE
03215	ARGENTINE	C	80	12	CATTLE	FALL RIVER
03218	HOME RANCH WEST	C	40	10	CATTLE	BUTTE
03226	WEST RIVER	C	480	98	CATTLE	FALL RIVER
03227	THREE PARCEL	C	480	440	CATTLE	MEADE
03330	NORTH HWY	C	40	14	CATTLE	HARDING
07200	MAMOTH	C	40	5	CATTLE	FALL RIVER
07201	LOST	C	920	298	SHEEP	BUTTE
07202	BAMS BUTTE	C	160	47	CATTLE	HARDING
07203	BLACKROOT	C	160	53	CATTLE	HAAKON
07204	LONETREE	C	240	71	CATTLE & SHEEP	BUTTE
07205	SOUTH DOUBLE R	C	472	156	CATTLE	BUTTE
07206	PATS DRAW	C	592	151	CATTLE	PENNINGTON
07207	CLARKS FORK CREEK	C	40	10	CATTLE	HARDING
07208	PD	C	160	33	CATTLE	FALL RIVER
07209	BULL CREEK	C	37	11	CATTLE	HARDING
07210	F. ROCK CREEK	C	635	172	CATTLE	PERKINS
07211	HIGHWAY 73	C	40	14	CATTLE	JACKSON
07212	BIG CEDAR	C	521	163	CATTLE	PERKINS
07214	BEAVER CREEK	C	120	11	CATTLE	FALL RIVER
07215	LITTLE CEDAR	C	600	129	CATTLE	PERKINS
07216	RIVERSIDE	C	87	21	CATTLE	HARDING
07217	SPRING	C	39	13	CATTLE	HARDING

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07218	SEAL DRAW	C	904	234	CATTLE & SHEEP	HARDING
07219	GRAVEL	C	40	14	CATTLE	BUTTE
07220	SNAKE CREEK	C	120	43	CATTLE	STANLEY
07223	QUINN TABLE	C	319	100	CATTLE	PENNINGTON
07224	LITTLE ARROW	C	120	39	CATTLE	PENNINGTON
07225	TELEGRAPH DRAW	C	921	227	CATTLE	MEADE
07226	BIG SKY	C	75	25	CATTLE	HARDING
07227	HELL CANYON	C	2335	503	CATTLE & BISON	CUSTER
07228	SECTION 8	C	80	20	CATTLE	FALL RIVER
07229	MINNECONJOU	C	680	206	CATTLE	STANLEY
07230	WARREN CREEK	C	120	31	CATTLE	BUTTE
07231	HANSON	C	120	36	CATTLE	HARDING
07232	BOX ELDER	C	240	78	CATTLE	BUTTE
07233	ORTON FLAT	C	303	100	CATTLE	STANLEY
07234	GRAND RIVER	C	200	51	CATTLE	HARDING
07236	RC	C	80	25	CATTLE	BUTTE
07237	TRIPLE THREE	C	200	60	CATTLE	MEADE
07238	BARKER	C	398	142	SHEEP	BUTTE
07239	SUNNYSIDE	C	120	36	CATTLE	PENNINGTON
07241	BEAVER CREEK	C	73	18	CATTLE	FALL RIVER
07242	SLICK CREEK	C	40	10	CATTLE	HARDING
07243	RED OWL CREEK	C	520	158	CATTLE	MEADE
07244	LAKE CREEK	C	240	23	CATTLE	PENNINGTON
07245	COWBOY CREEK	C	840	228	CATTLE	HARDING
07246	RABBIT CREEK	C	120	38	CATTLE & BISON	PERKINS
07247	LITTLE DRAW	C	80	24	CATTLE	PENNINGTON
07248	POVERTY POINT	C	70	22	CATTLE	MEADE
07249	RIVER	C	60	9	CATTLE	FALL RIVER
07250	GRAND RIVER	C	118	31	CATTLE	HARDING
07251	ELK CREEK	C	80	27	CATTLE	MEADE
07255	STAGE HILL	C	240	40	CATTLE	FALL RIVER
07257	WILLUWEIT	C	40	12	CATTLE	PENNINGTON
07258	ANGUSTORA	C	15	3	CATTLE	FALL RIVER
07259	S. CAVE HILLS	C	280	88	CATTLE	HARDING
07260	SHOULDER CREEK	C	80	24	CATTLE	STANLEY
07261	BUCK SKIN	C	160	50	CATTLE	MEADE
07262	HOLLOW	C	37	13	CATTLE	BUTTE
07263	CHANTIER	C	882	232	CATTLE	STANLEY
07264	SANSARC	C	440	147	CATTLE	STANLEY
07265	SAGE CREEK	C	119	20	CATTLE	PENNINGTON
07266	RAPID CREEK	C	128	20	CATTLE	PENNINGTON
07267	LUCKY 7	C	20	7	CATTLE	HARDING
07269	WHITE DRAW	C	40	10	CATTLE	FALL RIVER

<i>Allotment Number</i>	<i>Allotment Name</i>	<i>Allotment Category</i>	<i>Public Acres</i>	<i>Public AUMs</i>	<i>Livestock Class</i>	<i>County</i>
07270	WHITE DRAW	C	40	10	CATTLE	FALL RIVER
07271	CHEYENNE	C	20	3	CATTLE	FALL RIVER
07272	BUFFALO GAP	C	120	12	CATTLE	CUSTER
07273	PLAINS VALLEY	C	40	5	CATTLE	FALL RIVER
07274	PASS CREEK	C	80	16	CATTLE	FALL RIVER
07275	HEIKKILA	C	40	10	SHEEP	HARDING
07276	CROSSING	C	40	9	CATTLE	HARDING
07277	DRY CREEK	C	80	14	CATTLE	FALL RIVER
07278	FROZENMANS CREEK	C	80	16	CATTLE	STANLEY
07279	PLUM CANYON	C	40	8	CATTLE	CUSTER
07280	WIND CAVE	C	40	10	BISON	CUSTER
07281	CHEYENNE	C	320	36	CATTLE	FALL RIVER
07282	GOBBLER CANYON	C	37	12	CATTLE	FALL RIVER
07283	CAVE HILLS	C	273	80	CATTLE	HARDING
07284	WAPITI CREEK	C	40	14	CATTLE	MEADE
07285	PRAIRIE CREEK	C	80	20	CATTLE	STANLEY
07286	KADOKA JUNCTION	C	40	13	CATTLE	JACKSON
07287	PLUM CREEK	C	40	10	CATTLE	STANLEY
07288	ELKHORN PEAK	C	160	19	CATTLE	CUSTER
07290	HAWKWRITE	C	40	10	CATTLE	CUSTER
07292	SAND CREEK	C	360	100	CATTLE	BUTTE
07293	CAR BODY	C	240	58	CATTLE	BUTTE
07294	COUNTY LINE	C	40	12	CATTLE	HARDING
07295	SHEEP MOUNTAIN	C	160	30	SHEEP	HARDING
07296	DRY CREEK	C	80	9	CATTLE	HARDING
07297	MATSON-FOWLER	C	144	59	SHEEP	HARDING
07298	GREY ROCK	C	40	14	CATTLE	HARDING
07299	L. MISSOURI	C	63	17	CATTLE	HARDING
07300	PLUM CR.	C	40	7	CATTLE	HARDING
07302	LITTLE WILLOW	C	80	22	SHEEP	BUTTE
07303	TRAIL CREEK	C	22	6	CATTLE	BUTTE
07304	GRANDVIEW	C	128	32	CATTLE	HARDING
07305	BIG NASTY CREEK	C	40	13	CATTLE	HARDING
07306	TURTLE CREEK	C	40	12	CATTLE	MEADE
07307	EAST BRANCH	C	40	12	CATTLE	MEADE
07308	PLAINVIEW	C	24	7	CATTLE	MEADE
07309	BUTTE LINE	C	40	7	CATTLE	BUTTE
07310	MUD BUTTE	C	40	12	CATTLE	MEADE
07311	TRAIL CREEK	C	40	13	CATTLE	MEADE
07312	WASTA	C	163	38	CATTLE	PENNINGTON
07313	NE MUD BUTTE	C	40	12	CATTLE	BUTTE
07314	RANCHSIDE	C	40	8	CATTLE	FALL RIVER
07315	LEGER DAM	C	80	20	SHEEP	HARDING
07316	LONE FORTY	C	40	11	CATTLE	MEADE
07317	LONE DRAW	C	40	10	CATTLE	HARDING
07318	STONEY BUTTE	C	40	12	CATTLE	HARDING

<i>Allotment Number</i>	<i>Allotment Name</i>	<i>Allotment Category</i>	<i>Public Acres</i>	<i>Public AUMs</i>	<i>Livestock Class</i>	<i>County</i>
07319	BEAR CREEK	C	130	40	CATTLE	PENNINGTON
07320	SHIRT TAIL	C	160	50	CATTLE	MEADE
07321	NORTH	C	120	36	CATTLE	PERKINS, MEADE
07322	MUD CREEK	C	80	20	CATTLE	PERKINS
07323	FLINT ROCK CREEK	C	40	12	CATTLE	PERKINS
07324	DRY RUN CREEK	C	44	12	CATTLE	STANLEY
07325	LONE TREE	C	60	18	CATTLE	HARDING
07326	BIXBY ROAD	C	200	43	CATTLE	PERKINS
07327	HIGHLAND	C	40	8	CATTLE	PERKINS
07328	BIXBY	C	320	101	CATTLE	PERKINS
07329	MOSIER	C	320	42	CATTLE	FALL RIVER
07330	SIGNAL BUTTE	C	80	36	CATTLE	PERKINS
07331	SCHOOL SECTION	C	40	13	CATTLE	BUTTE
07333	MIDDLE CREEK BUTTE	C	562	84	CATTLE	BUTTE
07334	PORCUPINE CREEK	C	40	8	CATTLE	PERKINS
07335	S. BULL CREEK	C	80	20	CATTLE & SHEEP	HARDING
07336	DUHAMEL FLAT	C	160	54	CATTLE	PENNINGTON
07337	CLAY PIT	C	333	30	CATTLE	BUTTE
07338	LITTLE FLINT	C	40	13	CATTLE	PERKINS
07339	KIMBLE CREEK	C	71	24	CATTLE	HARDING
07340	DRIFT WOOD	C	43	10	CATTLE	FALL RIVER
07341	BENCH	C	40	12	CATTLE	MEADE
07342	M. BUTTE	C	54	15	CATTLE	MEADE
07343	WHITE THUNDER BOTTOM	C	40	15	CATTLE	HAAKON
07344	HORSE CREEK	C	160	45	CATTLE	BUTTE
07345	RAILROAD	C	40	7	CATTLE	HAAKON
07346	SPOTTED BEAR CREEK	C	40	10	CATTLE	HAAKON
07347	SOUTH	C	40	11	CATTLE	MEADE, PERKINS
07348	HAT CREEK	C	40	5	CATTLE	FALL RIVER
07349	SUNRISE BUTTE	C	200	47	CATTLE	PERKINS
07350	LAHTI BUTTE	C	280	92	CATTLE	HARDING
07351	LOCATE CREEK	C	91	46	CATTLE	PERKINS
07352	WEST BULL	C	40	8	CATTLE	MEADE
07354	BERRY CREEK	C	80	27	CATTLE	PERKINS
07355	PINE CREEK	C	40	12	CATTLE	MEADE
07356	SUNDING	C	49	14	SHEEP	HARDING
07357	MUELLER	C	80	17	CATTLE	CUSTER
07358	DOTY RIDGE	C	40	13	CATTLE	STANLEY
07359	PINEY CREEK	C	80	12	CATTLE	FALL RIVER
07360	SECTION 28	C	40	10	CATTLE	PERKINS
07361	ASH CREEK	C	40	11	CATTLE	HAAKON
07362	INDIAN SPRINGS	C	40	13	CATTLE	HAAKON
07363	WHITE RIVER	C	160	53	CATTLE	JACKSON

<i>Allotment Number</i>	<i>Allotment Name</i>	<i>Allotment Category</i>	<i>Public Acres</i>	<i>Public AUMs</i>	<i>Livestock Class</i>	<i>County</i>
07364	FOX RIDGE	C	40	12	CATTLE	MEADE
07365	HAXBY DRAW	C	40	13	CATTLE	HAAKON
07366	MEADOW LARK	C	40	10	CATTLE & SHEEP	PERKINS
07367	HILLSIDE	C	40	3	CATTLE	CUSTER
07368	ANTLER	C	40	10	CATTLE	PENNINGTON
07369	NASTY CREEK	C	28	9	CATTLE	PERKINS
07370	SORUM	C	40	10	CATTLE	HARDING
07372	LEMMON BUTTE	C	40	5	CATTLE	MEADE
07374	BUR OAK	C	40	6	CATTLE	LAWRENCE
07376	HWY 71	C	40	10	CATTLE	FALL RIVER
07377	CROW EAGLE CREEK	C	80	25	CATTLE	STANLEY
07378	LITTLE MO	C	55	18	CATTLE	HARDING
07379	BAMS	C	40	10	CATTLE	HARDING
20699	SECTION 19	C	40	11	CATTLE	BRULE

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Appendix N

Land Ownership Adjustment Criteria

Retention Criteria

- Congressionally designated and other special management areas (i.e. ACECs, National or Historic Trails, etc.)
- Lands acquired using Land and Water Conservation Funds (LWCF)

Disposal Criteria

- Tracts of land that because of its location or other characteristics is difficult and uneconomic to manage or is not suitable for management by another Federal department or agency as part of the public lands.
- Tracts of land that were acquired for a specific purpose and the tract is no longer required for that or any other Federal purpose.
- Disposal of tract of land that will serve important public objectives, including but not limited to, expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than public land and which outweigh other public objectives and values, including, but not limited to, recreation and scenic values, which would be served by maintaining such tract in Federal ownership.
- Surrounded by private land
- No improved public access
- No significant resource values
- Selected for management issues
- Lands with unauthorized occupancy use where permanent structures are involved.

Acquisition Criteria

- Facilitate access to BLM land and resources
- Enhance the manageability of BLM land and resources
- Enhance important public values and uses, especially
 - Special Status Species plant, animal, and fish habitats
 - Significant historic, cultural resources or properties important to Native Americans
 - Significant recreational opportunities
 - Significant scenic values
- Facilitate implementation of other goals and objectives
- Avoid acquiring lands or interests in lands with management problems that outweigh the expected benefits of acquisition, including but not limited to:
 - Presence of hazardous materials

- Abundance of invasive, non-native species
- Inadequate access for managing the property for the purpose for which it would be acquired
- Cultivated lands, buildings and other improvements

Land Retention and Disposal Classifications for Alternatives B, C and D:

Acres in each category varies by Alternative as shown in the Land Tenure section of Table 2-1 and 2-2.

Category 1 – Retention area with no disposal : Lands managed in Category I – Retention would include all ACECs and lands acquired through LWCF. Category I lands would not be transferred from BLM management by any method for the life of the plan.

Category 2 - Retention with Limited disposal potential based on specialist review: Public lands within Category II would be considered for limited land ownership adjustments; however, lands in Category II would not be available for sale under section 203 of FLPMA. Some public lands in Category II may contain resource values protected by law or policy. If actions cannot be taken to adequately mitigate impacts from disposal of those lands, those parcels would be retained.

Category 3 – Disposal contingent on specialist review: These lands generally are isolated or fragmented from other public land ownerships making them difficult to manage. Public land parcels in this category are relatively smaller in size (typically 160 acres or less). A map of these disposal parcels can be found by alternative in Map 2-2. These parcels have been found to potentially meet the sale criteria of section 203(a)(1) of FLPMA and could be made available for sale or disposal through any method.

Access Criteria

- The BLM shall endeavor to maintain existing access, provide future access, and manage public access to BLM administered lands in coordination with other Federal agencies, state and local governments, and private landowners.
- Obtain access to BLM administered lands in retention areas. (Acquisition of access outside of retention areas may be considered if the action leads to and/or facilitates long term needs or program objectives).
- Protect, maintain, and manage existing access to BLM administered lands.
- Manage access to BLM administered lands within BLM's multiple-use mandate.
- Acquire access on the basis of the following considerations:
 - Where there are moderate to high resource values on existing BLM administered land.
 - Where there is public demand which is closely tied to resource values. Access to larger blocks or parcels of BLM administered land have priority. The presence of important resource values may justify acquiring access to smaller tracts.
 - For those projects on BLM administered lands in which substantial public monies have been spent, and in which continuing diverse public use is expected, permanent exclusive access for the general public should be obtained. For lesser investment projects and/or those to which general public use will need to be limited, nonexclusive easements should be obtained.
 - Although the Bureau is not required to provide access to mineral resources, the acquisition of such access could be useful in controlling the construction of multiple and unnecessary access routes within the same general area.
 - Priority would be placed on acquiring easements on roads where landowners are willing to allow public access through their lands.

Appendix O

Soils Monitoring

<i>Item</i>	<i>Location</i>	<i>Technique</i>	<i>Unit of Measure</i>	<i>Frequency and Duration</i>	<i>Remedial Action Trigger</i>	<i>Management Options</i>
Soil erosion, uplands	Area-wide where management activities are occurring or expected to occur.	Visual observation, rangeland health or proper functioning condition assessments, surface aggregate stability test, and surveyed erosion pins.	Soil loss in tons per acre.	Site will be visually examined quarterly. Where erosion is deemed excessive, measurements of site characteristics will be taken to determine rate of soil loss.	Visual evidence of pedestal, terracete, wind scour, rill, gully, or sheet erosion. Change in surface aggregate stability class. Loss of soil exceeding 10 T/ac/yr.	Report exceedance to BLM, State or EPA. Enforcement action will be taken.
Soil erosion, streambanks, riparian areas, and floodplains	Area-wide along rivers and tributaries where management activities are occurring or expected to occur.	Visual observation, rangeland health or proper functioning condition assessments, and surveyed erosion pins.	Area affected in square feet or acres.	Site will be visually examined quarterly. Where streambank erosion is deemed excessive, measurements of site characteristics will be taken to determine soil loss.	Visual evidence of headcut or bank slump. A 10% increase in streambank loss.	Report exceedance to BLM, State or EPA. Enforcement action will be taken.
Soil salinization and sodification	Area-wide where management activities are occurring or expected to occur.	Visual observation, measurement of soil characteristics such as EC, SAR, ESP, pH.	Area affected in square feet or acres.	Site will be visually examined quarterly. Where salinity levels show an increase because of vegetation or soil effects, measurements of site characteristics will be taken to determine salinity and sodicity levels.	A 20% increase in levels. EC greater than 8, SAR greater than 8, ESP greater than 10, or pH greater than 8.5	Report exceedance to BLM, State or EPA. Enforcement action will be taken.
Compaction	Area-wide where management activities are occurring or expected to occur.	Visual inspection, penetrometer, or ratio of penetration resistance or bulk density to that of the reference area.	Pounds per square inch, mass per volume.	Site will be visually examined 1 to 2 times yearly. Where compaction is deemed excessive, measurements would be taken.	10% increase in density. Ratio of penetration resistance or bulk density to that of the reference area greater than 1.	Limit or block access to compacted sites.
Rutting	Area-wide where management activities are occurring or expected to occur.	Visual observation and measured depth of rut.	Inches.	Site will be visually examined 1 to 2 times yearly. Where rutting is deemed excessive, measurements would be taken.	Ruts exceed 4 inch depth.	Limit or block access to rutted sites.
Productivity	Areas where reclamation or restoration is occurring or expected to occur.	Visual observation, line- point intercept, gap intercept, and aggregate stability test, Total dry- weight production of vegetation.	Proportion of area, time to percent dissolved, dry weight per area.	Site will be visually examined 1 to 2 times yearly. Where fertility is deemed poor, measurements would be taken.	10% increase in percent of bare ground. Change in surface or subsurface aggregate stability class. 10% decline in total dry weight.	
Subsidence of fill material	Areas where management activities require fill material.	Visual observation and measured depth of subsidence.	Feet.	Site will be visually examined 1 to 2 times yearly. Where slumping/piping is deemed excessive, measurements would be taken.	10% increase in slumping or piping depth.	Limit or block access to affected sites until area is reclaimed.

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Appendix P

Cultural Resources Standard Lease Stipulations for Grazing Leases

Cultural Resources

This lease may be found to contain historic properties and/or resources protected under the National Historic Preservation Act (NHPA), American Indian Religious Freedom Act, Native American Graves Protection and Repatriation Act, E.O. 13007, or other statutes and executive orders. The BLM will not approve any ground disturbing activities that may affect any such properties or resources until it completes its obligations (e.g., State Historic Preservation Officer (SHPO) and tribal consultation) under applicable requirements of the NHPA and other authorities. The BLM may require modification to exploration or development proposals to protect such properties, or disapprove any activity that is likely to result in adverse effects that cannot be successfully avoided, minimized or mitigated.

Stipulation for Cultural Resource Protection

“The lease holder is not allowed to collect or give others permission to collect historic or prehistoric artifacts on Public Lands. An artifact is any human-made object or object used in its natural state by humans, which is at least 50 years old. The unauthorized collecting of prehistoric and historic artifacts on public lands is punishable under Federal law. If you observe individuals collecting artifacts, immediately notify the authorized BLM official.”

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Appendix Q

South Dakota Field Office Air Resource Management Plan: *Adaptive Management Strategy for Oil and Gas Resources*

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Acronyms

APD	Application for Permits to Drill
AQRV	Air quality related value
AQS	Air Quality System
AQTW	Air Quality Technical Workgroup
ARTSD	Air Resource Technical Support Document
BLM	Bureau of Land Management
CAMx	Comprehensive Air Quality Model with Extensions
CFR	Code of Federal Regulations
CO	Carbon monoxide
FLIR	Forward looking infrared
FLPMA	Federal Land Policy and Management Act
hp	Horsepower
$\mu\text{g}/\text{m}^3$	Micrograms per cubic meter
MOU	Memorandum of Understanding
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO	Nitric oxide
NO ₂	Nitrogen dioxide
NO _x	Nitrogen oxides
NPS	National Park Service
O ₃	Ozone
Pb	Lead
PGM	Photochemical grid modeling
PM ₁₀	Particulate matter with a diameter less than or equal to 10 microns
PM _{2.5}	Particulate matter with a diameter less than or equal to 2.5 microns
POD	Plan of Development
ppb	Parts per billion
ppm	Parts per million
REC	Reduced emissions completion
ROD	Record of Decision
RMP	Resource Management Plan
SDAAQS	South Dakota Ambient Air Quality Standards
SD DENR	South Dakota Department of Environment & Natural Resources
SLAMS	State or Local Air Monitoring Station
SO ₂	Sulfur dioxide
tpy	Tons per year
USDI	U.S. Department of Interior
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile organic compound
WRAP	Western Regional Air Partnership
WRF	Weather and Research Forecasting

1.0 Introduction

1.1 Purpose of the Air Resource Management Plan

The Bureau of Land Management (BLM) South Dakota Field Office (SDFO) Air Resource Management Plan (ARMP) for oil and gas activities describes the air quality adaptive management strategy that would be used to assess future air quality and Air Quality Related Values (AQRVs) and identify mitigation measures to address unacceptable impacts that could potentially be associated with future oil and gas development. The adaptive management strategy focuses on oil and gas activity because aggregated emissions from multiple small sources at well sites can potentially cause significant air quality and AQRV impacts under certain circumstances. Many of these small oil and gas emission sources are not required to obtain air quality permits from the South Dakota Department of Environment & Natural Resources (SD DENR).

The oil and gas adaptive management strategy was prepared in collaboration with or with the review of the U.S. Environmental Protection Agency (USEPA) and three federal land management agencies under the Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the National Environmental Policy Act [NEPA] Process (USDI 2011). This agreement is described in more detail in Section 1.4. Although not a signatory to the MOU, the SD DENR participates in the Air Quality Technical Workgroup (AQTW) that was established to implement the MOU process for the Proposed Resource Management Plan (PRMP) and Environmental Impact Statement (EIS). The Air Resource Management Plan provides a means for the BLM to satisfy its statutory responsibility under NEPA and the Federal Land Policy and Management Act (FLPMA) to protect air quality and other natural resources. Under the Air Resource Management Plan, the BLM will take appropriate management action if monitoring data for local areas with BLM-authorized oil and gas activity indicate that additional emission reductions may be needed to maintain good air quality. Due to the fragmentation of surface and mineral estate within the planning area, the BLM would work with the SD DENR to identify a consistent emission control approach throughout an area of concern.

The Air Resource Management Plan includes both near-term actions and long-term actions. In the near-term, the Air Resource Management Plan sets forth initial actions to maintain good air quality until regional modeling can be performed to further assess potential impacts to air quality and AQRVs. In the long-term, the Air Resource Management Plan provides ongoing management strategies to assess and adapt to new air quality and AQRV ambient monitoring and modeling data during the life of this Resource Management Plan (RMP).

The Air Resource Management Plan includes a multifaceted approach involving the following activities.

- Oil and gas activity assessment
- Ambient air quality monitoring support
- Air quality and AQRV assessment
- Future air quality and AQRV modeling
- Mitigation

Pollutant emissions addressed by the Air Resource Management Plan include the criteria air pollutants listed below.

- Carbon monoxide (CO)
- Nitrogen dioxide (NO₂)
- Ozone (O₃)
- Particulate matter with a diameter less than or equal to 10 microns (PM₁₀)
- Particulate matter with a diameter less than or equal to 2.5 microns (PM_{2.5})
- Sulfur dioxide (SO₂)

Two criteria air pollutants, CO and lead, are not monitored within the planning area because high concentrations of these pollutants are unlikely. Elevated concentrations of CO are associated with vehicle traffic in very large urban areas, while high concentrations of lead are typically found near industrial facilities that emit large quantities of lead compounds. These situations do not occur in the planning area, as described in Chapter 3 of the Draft RMP. CO emissions would be modeled to demonstrate compliance with the NAAQS. Due to the lack of lead emissions from oil and gas activities, lead emissions would not be modeled as part of the air quality analysis.

The Air Resource Management Plan also addresses modeling and mitigation for the following AQRV assessments.

- Deposition of sulfur and nitrogen
- Lake acid neutralizing capacity
- Visibility

The adaptive management strategy for oil and gas resources provides the flexibility to respond to changing conditions that could not be predicted during RMP development. This strategy also allows for the use of new technology and methods that may minimize or reduce impacts.

1.2 Revision of the Air Resource Management Plan

This Air Resource Management Plan may be modified as necessary to comply with law, regulation, and policy and to address new information and changing circumstances. Changes to the goals or objectives set forth in the SDFO RMP/EIS would require maintenance or amendment of the RMP while changes to implementation, including modifying this Air Resource Management Plan, may be made without amending the RMP.

1.3 Current Air Quality

Areas within the planning area are designated as areas that attain the National Ambient Air Quality Standards (NAAQS) and state-based standards known as the South Dakota Ambient Air Quality Standards (SDAAQS), which are identical to the NAAQS. Throughout this document references to the NAAQS will also be understood to include the SDAAQS.

1.4 Background of the AQTW and the MOU Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions through the NEPA Process

The Air Quality Technical Workgroup (AQTW) includes representatives from the following agencies: the BLM, USEPA, U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), and the National Park Service (NPS). Each of these agencies is a party to the *Memorandum of Understanding Among the U.S. Department of Agriculture, U.S. Department of the Interior, and U.S. Environmental Protection Agency, Regarding Air Quality Analyses and Mitigation for Federal Oil and Gas Decisions Through the National Environmental Policy Act Process* (USDI 2011) (herein referred to as the MOU). This agreement is designed to “. . . facilitate the completion of NEPA environmental analyses for Federal land use planning and oil and gas development decisions [USDI 2011].”

The MOU sets forth collaborative procedures that the AQTW agencies use to analyze potential air quality and AQRV impacts. The agencies also work together to identify potential mitigation measures that may be needed to reduce impacts to air quality and AQRVs. The lead agency (the BLM in this case), in collaboration with the other agencies, has the responsibility to identify reasonable mitigation and control measures to address adverse impacts to air quality. Mitigation measures may also address impacts to AQRVs at Class I areas and at sensitive Class II areas that have been identified by the BLM, USFS, USFWS, and NPS.

The AQTW provided input to this Air Resource Management Plan and will continue to work collaboratively on future modeling efforts associated with this RMP. Provisions of the MOU continue to apply to future oil and gas activities in the planning area. In some cases, air quality and AQRV modeling performed under this Air Resource Management Plan may be sufficient to address modeling needs for future oil and gas projects that would otherwise require additional modeling under the MOU. However, the Air Resource Management Plan in no way replaces provisions of the MOU. Determinations of existing modeling adequacy for future oil and gas activities that trigger the MOU would be made collaboratively by the AQTW using the procedures included in the MOU.

The SD DENR has the primary authority to protect air quality within the state. Although the SD DENR is not a signatory to the national MOU, successful air quality management of BLM-authorized oil and gas activities depends on a close working relationship between the BLM and the SD DENR. The two agencies have worked together to improve air quality monitoring and will continue to cooperate by sharing data, planning modeling efforts, and working together to identify emission reduction measures needed to maintain good air quality.

1.5 BLM's Role With Regard to Air Resources

Primary air quality management authority and responsibility for the planning area rest with the SD DENR (for non-tribal areas of the planning area) and the USEPA for tribal areas. The BLM's authority to address air resources

derives primarily from FLPMA and NEPA. Under FLPMA, the BLM must “provide for compliance with applicable pollution control laws, including State and Federal air, water, noise, or other pollution standards or implementation

plans” in the development and revision of land use plans (Section 202 (c)(8)). FLPMA also authorizes the BLM to manage public lands “in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values” (Section 102 (8)).

Under NEPA, the BLM ensures that information on potential environmental and human impacts of Federal actions is available to public officials and citizens before decisions are made and before actions are taken. One of the purposes of the Act is to “promote efforts which will prevent or eliminate damage to the environment and biosphere,” and to promote human health and welfare (Section 2). NEPA requires that BLM and other federal agencies prepare a detailed statement on the environmental impact of the proposed action for major Federal actions expected to significantly affect the quality of the human environment (Section 102 (C)).

The BLM’s authority under the Clean Air Act primarily derives from the requirement that BLM-authorized activities comply with the Clean Air Act. BLM-authorized activities may not violate the Clean Air Act or federal and state regulations and State Implementation Plans issued to implement the Act. When air quality or AQRV modeling performed during NEPA analysis predicts potential violations of the Clean Air Act or unacceptable AQRV impacts, the BLM evaluates the data and determines whether mitigation measures are needed. For example, the initial mitigation measure requiring drill rig engines to meet Tier 4 emission standards reduces NO₂ emissions and was demonstrated via modeling to prevent NAAQS violations from multiple large drill rig engines that may operate on one well pad. The mitigation measure includes an exception that allows use of drill rig engines meeting Tier 1, 2, or 3 emission standards if future modeling or near-field monitoring demonstrates compliance with the NAAQS.

When determining whether mitigation measures are needed, the BLM reviews current and proposed federal, state, and local regulations to determine whether mitigation will occur due to other agency actions. If the BLM determines that additional mitigation is needed while implementing this Air Resource Management Plan, the BLM will work closely with the SD DENR to coordinate future mitigation measures for BLM-authorized activities.

2.0 Oil and Gas Activity Assessment

Each year, the BLM would track the number and locations of new oil and gas wells drilled on federal mineral estate and the number of new and abandoned producing wells on federal mineral estate. These numbers would be compared to the planning area RFD and to the level of oil and gas development identified in the Approved RMP.

In addition, the BLM would estimate oil and gas emissions from federal mineral estate every three years for oil and gas wells drilled and producing after the ROD is signed. Emission estimates will be based on well types, well numbers, and knowledge of typical equipment and operations. Emission estimation methods are expected to improve over time as better data become available. The emission estimates would also account for implemented mitigation measures and for new emission control regulations as they become effective. The BLM would collect additional data related to oil and gas equipment and operations to improve emission inventory quality. One area identified for improvement involves acquiring better data on oil and gas equipment used in the planning area. In order to improve fugitive dust emission estimates, the number, type, and length of vehicle trips in high-activity areas would also be assessed.

Each three-year oil and gas emission inventory would be compared to emission estimates for the RFD and the Approved RMP. .

3.0 Ambient Air Quality Monitoring Support

The Air Quality Program of the SD DENR has primary responsibility for siting and operating ambient air quality monitors within South Dakota and for reporting monitoring data to USEPA and to the public. As described in its annual Ambient Air Monitoring Annual Network Plan (SD DENR 2012), the SD DENR identifies monitoring objectives for assessing ambient concentrations of criteria air pollutants and assessing compliance with the NAAQS.

Monitors that are located within the planning area and are representative of rural areas near oil and gas activity are listed in Table 1. These monitors would be used by the BLM when developing annual air quality assessments. If additional SD DENR monitoring stations are installed and operated for the purpose of assessing air quality impacts from oil and gas activity, data from these monitors would be used for ambient air quality assessments under this plan.

Table 1. Representative Air Quality Monitoring Stations Within the Planning Area					
<i>Station Name</i>	<i>Pollutants Monitored by SLAMS</i>	<i>Station Number</i>	<i>County</i>	<i>Latitude</i>	<i>Longitude</i>
Badlands	NO ₂ , O ₃ , PM ₁₀ , PM _{2.5} , SO ₂	46-071-0001	Jackson	N 4,847,799.95	E 263,173.81
Wind Cave	O ₃ , PM ₁₀ , PM _{2.5}	46-033-0132	Custer	N 4,823,856.93	E 622,471.56

Latitude and longitude are provided in UTM coordinates based on Zone 13, NAD 83.

4.0 Air Quality and AQRV Assessment

The BLM would assess air quality and AQRVs on an annual basis using quality-assured data from the USEPA, SD DENR, USFS, USFWS, NPS, and other sources. In addition, a preliminary assessment of ozone concentrations would be performed on a weekly basis using data provided by the SD DENR.

4.1 Annual NAAQS Assessment

Based on the monitors listed in Section 3.0, the BLM would assess air quality monitoring data annually and would share the results of the assessment with the SD DENR and AQTW. The purposes of the annual assessment are to compare monitored data to NAAQS and to identify seasonal and long-term trends in air pollutant concentrations. The BLM would complete the annual assessment by May 31 of each year in order to ensure that quality-assured data are available for review.

NAAQS are provided in Table 2 for pollutants monitored within the planning area. As of December 1, 2012, CO and lead were not monitored within the planning area. The standards shown in Table 2 would be revised to reflect future regulatory changes.

Table 2. NAAQS for Pollutants Monitored in the Planning Area				
<i>Pollutant</i>	<i>Averaging Period</i>	<i>Concentration</i>	<i>Standard Type</i>	<i>Form of NAAQS¹ Primary Standard</i>
NO ₂	1-hour	100 ppb	Primary	3-year average of the 98 th percentile concentrations
	Annual	53 ppb	Primary, Secondary	Annual mean
Ozone	8-hour	0.075 ppm	Primary, Secondary	3-year average of the fourth highest daily maximum 8-hour average
PM _{2.5}	24-hour	35 µg/m ³	Primary, Secondary ³	3-year average of the 98 th percentile concentrations
	Annual	12.0 µg/m ³ ² 15.0 µg/m ³	Primary, Secondary	3-year average annual mean
PM ₁₀	24-hour	150 µg/m ³	Primary, Secondary	NTBE more than one per year on average over 3 years
SO ₂	1-hour	75 ppb	Primary	3-year average of the 99 th percentile concentrations
	3-hour	0.5 ppm	Secondary	Annual 2nd highest maximum of 3-hour block averages

µg/m³ micrograms per cubic meter
 NAAQS National Ambient Air Quality Standards
 NO₂ nitrogen dioxide
 NTBE not to be exceeded
 PM_{2.5} particulate matter less than or equal to 2.5 microns
 PM₁₀ particulate matter less than or equal to 10 microns
 ppb parts per billion
 ppm parts per million
 SO₂ sulfur dioxide

¹ NAAQS are codified in Title 40 of the Code of Federal Regulations (CFR), Part 50.
² Effective March 18, 2013, the primary annual PM_{2.5} standard was revised from 15.0 µg/m³ to 12.0 µg/m³.
³ The secondary annual PM_{2.5} standard remains at 15.0 µg/m³.

The BLM would use design values to compare ambient monitoring data to the NAAQS. Design values reflect the form of the NAAQS; they define the statistical metric used to compare monitoring data to federal and state standards. Depending on the pollutant and averaging time being assessed, the NAAQS is typically stated in terms of the maximum or second maximum concentration, average concentration, or a percentile of the standard. The form of a standard also states whether the design value is determined based on one or more years of monitoring data. USEPA-calculated design values serve a critically important regulatory purpose; they determine whether areas are designated attainment or nonattainment. As such, USEPA's design value determinations may take more than one year to finalize.

In order to review air quality trends more quickly, the BLM would determine "mitigation design values" by May 31 of each year for the previous calendar year(s). The mitigation design value would be a metric calculated by the BLM that uses procedures similar to USEPA's regulatory design value calculation methodology, with the advantage that the BLM-calculated mitigation design values can be determined more quickly. The timing allows the SD DENR adequate time to quality assure monitoring data. However, the SD DENR may not yet have USEPA concurrence on data that has been flagged by the SD DENR due to exceptional events, such as wildfires. Consequently, the BLM-calculated mitigation design values would exclude monitoring data associated with SD DENR-identified exceptional events. Each BLM annual assessment would look back the requisite number of years for each pollutant and include data from the time period prior to ROD issuance for the first several annual BLM assessments. Additional information concerning design value calculations is provided in Section 6.2.3. The BLM will work closely with the SD DENR to ensure that only data certified by the SD DENR and procedures consistent with MDEQ procedures are used in design value calculations.

4.2 Preliminary Ozone Assessment

BLM would perform weekly preliminary ozone concentration reviews to determine if high ozone events occur at the monitors identified in Section 3.0. If a high-ozone event occurs, the BLM would document meteorological and other conditions that may have contributed to the event. Because high-ozone events in other rural parts of the nation are not well understood and contributing factors can be site-specific, the BLM would gather data to develop baseline information relevant to any high-ozone events that may occur within the planning area. Relevant baseline information includes capturing meteorological data for each event, determining the amount of snow on the ground (if applicable), and identifying any other data that may help describe circumstances associated with the event. For the purposes of this effort, a high-ozone event would be defined as a day for which the maximum 8-hour average ozone concentration is at or above 0.065 ppm.

In order to quickly ascertain relevant circumstances, the preliminary ozone assessments would use non-quality-assured data provided by the SD DENR. As part of the annual NAAQS assessment, quality-assured ozone data would be reviewed to determine if the preliminary ozone monitoring data were valid or if monitored high ozone concentrations were due to monitor malfunctions.

If high-ozone events occur within the planning area, a summary of events and a discussion of relevant meteorological data and circumstances would be developed as part of the annual NAAQS assessment. These summaries and the underlying data may provide important information that can be used to predict potential occurrences of high-ozone events and to identify mitigation measures and/or proactive measures that could prevent future events.

4.3 Annual AQRV Assessment

Federal land managers track the status, condition, and trends of AQRVs for Class I and sensitive Class II areas under their jurisdictions. Consequently, the BLM would request visibility, sulfur and nitrogen deposition, and lake acid neutralizing capacity data from the USFS, USFWS, and NPS and would include agency-submitted data in the BLM's annual review of AQRV trends. The annual review would also include AQRV data from any Class I or sensitive Class II areas under BLM jurisdiction.

Based on these reviews, the BLM would maintain an awareness of AQRV trends. However, it should be noted that the reviews would not necessarily link AQRV trends to oil and gas development within the planning area. AQRV impacts are often associated with pollutants that can be transported long distances from many different types of sources. For example, sources outside South Dakota play a major role in visibility degradation at Wind Cave National Park and at Badlands National Park, as described in the South Dakota's Regional Haze State Implementation Plan (SD DENR 2011).

5.0 Future Modeling

The BLM committed to perform PGM in order to assess regional air quality and AQRV impacts. Due to insufficient monitoring and regional emissions data available during development of the RMP, PGM will not be completed prior to issuance of the RMP/EIS and the ROD. In order to complete PGM expeditiously, the BLM began data acquisition and initiated steps needed to proceed with PGM. When PGM is completed and the results assessed, the BLM may identify additional emission mitigation measures for oil and gas activity.

5.1 Photochemical Grid Modeling

Comprehensive regional air quality and AQRV regional modeling of emission sources within the planning area and surrounding areas requires PGM. This type of modeling can predict ozone and regional haze impacts, for which major pollutants and precursors can be transported many hundreds of miles.

5.1.1 Data Acquisition

PGM requires three main types of concurrent data: meteorological data, ambient monitoring data, and comprehensive emission data. BLM's analysis determined that the latter two types of data need to be augmented and updated prior to performing PGM.

Additional Monitoring

Ambient monitoring data throughout the PGM domain is needed in order to validate model performance, which is assessed by modeling a previous year and comparing the model's predicted concentrations to actual monitored concentrations. New monitors in northern and central Montana near the towns of Malta and Lewistown will provide much-needed data to assess model performance in areas with oil and gas activity northwest of the planning area.

Updating Emission Inventories

Comprehensive emission inventories are also critically important in predicting cumulative air quality and AQRV impacts. Current oil and gas regional emission inventories for South Dakota are known to lack important emission sources, particularly sources of volatile organic compounds (VOCs), which contribute to ozone formation. The existing regional oil and gas inventory for the Williston Basin represents the year 2002 and was developed as part of the Western Regional Air Partnership (WRAP) Phase II inventory. Since then, 2006 Phase III emission inventories have been developed for oil and gas basins within Colorado, Utah, Wyoming, and New Mexico, but have not yet been completed for Montana, North Dakota, and South Dakota. The Phase III inventories have more comprehensive emission inventories of VOC sources at oil and gas facilities.

The BLM Montana and Dakotas State Office is providing financial assistance to the WRAP so that Phase III oil and gas emission inventories can be completed in early 2014 for the Williston Basin and the Great Plains Basin. These inventories would represent calendar year 2011 emissions. In addition to covering the planning area, the inventories would include comprehensive recent emission estimates for oil and gas activity in North Dakota and Montana.

5.1.2 PGM Schedule

In order to use a full 12 months of ambient monitoring data from the new monitors in northern and central Montana, the baseline year for PGM is expected to be 2013 or may be a 12-month period beginning in late 2012 and ending in 2013. PGM planning began in 2012 and development of the PGM modeling protocol was completed during 2013, with modeling occurring primarily in 2014 and early 2015. Review and assessment of PGM results would be completed in Fall 2015. Table 3 provides the data acquisition and PGM schedule.

The Weather Research and Forecasting (WRF) model would be used to model meteorological conditions and the Comprehensive Air Quality Model with Extensions (CAMx) model would be used for photochemical grid modeling. In addition, multiple models would be used to develop and process emission inventories for input into the photochemical grid model. When modeling is completed, an Air Resource Technical Support Document (ARTSD) would be developed.

Initial PGM would include future year modeling for a year between 2017 and 2030 using emissions representing full

development of BLM oil and gas resources under the Approved RMP. The specific year would be determined by the BLM based on the ability to predict future cumulative regional oil and gas emissions in the Williston and Great Plains Basins. After initial PGM is completed, the BLM would begin an assessment process to determine when or if additional PGM may be needed. Factors to be considered in determining when additional PGM would be needed include the adequacy of the adaptive management strategy to maintain good air quality, and the level of BLM-authorized oil and gas activity and emissions compared to modeled levels.

Table 3. Data Acquisition and PGM Schedule	
<i>Task / Subtask</i>	<i>Completion Date</i>
Pre-Modeling Emission Inventory *	
Williston and Great Plains Basin Inventory	3/31/2014
Base Year Modeling and Evaluation *	
WRF Modeling	5/8/2014
Draft WRF Model Evaluation	6/5/2014
AQW and SD DENR WRF Evaluation Review	7/10/2014
Emission Modeling (Base and Future Year) & Report	9/9/2014 (base year) 12/11/2014 (future year)
AQW and SD DENR Emission Modeling Review	10/2/2014 (base year) 1/7/2015 (future year)
Base Year Photochemical Grid Modeling	8/28/2014
Draft Base Year PGM Evaluation	11/17/2014
AQW and SD DENR PGM Evaluation Review	12/1/2014
Finalize WRF and PGM Evaluations	12/15/2014
Emission Modeling Reports	1/21/2015
Future Year Modeling and Evaluation *	
Future Year Photochemical Grid Modeling	3/8/2015
Analyze Air Quality and AQRV Impacts	3/29/2015
Draft ARTSD	4/19/2015
AQW and SD DENR ARTSD Review	6/19/2015
Finalize ARTSD	7/1/2015

* Dates are estimated and subject to revision.

AQW = Air Quality Technical Workgroup

ARTSD = Air Resource Technical Support Document

SD DENR = South Dakota Department of Environment & Natural Resources

PGM = Photochemical grid modeling

RFP = Request for Proposal

WRF = Weather Research and Forecasting Model

5.1.3 SD DENR and AQW Review and Input to PGM

Throughout the PGM data collection and modeling process, the BLM would work collaboratively with the SD DENR AQW, and with and other agencies or Tribes that request to be involved in the PGM effort. These collaborators provided technical review and comment on the modeling protocol, and will provide input on the WRF and PGM performance evaluations, and on the draft ARTSD. Substantial time has been included in the schedule shown in Table 3 to allow adequate review and comment periods during the PGM process.

5.1.4 Availability of PGM Results

Future PGM results would be presented in the final ARTSD and in a summary of the results. The ARTSD and summary document would be posted on the SDFO website. In addition, the WRF and PGM protocol document would be provided

via the website when the photochemical modeling ARTSD is made available. Outreach information regarding the availability of the results would be made through the AQTW and agencies involved in the PGM process, as well as other interested parties.

5.2 Post-PGM Modeling

To the extent that future emission increases are within the levels modeled with PGM or other modeling and are proximate to modeled emission locations, far-field air quality and AQRV impact analysis may incorporate by reference PGM and other modeling results. The BLM and the AQTW would determine whether previous modeling is sufficient to satisfy MOU requirements. This air quality management approach is consistent with the Air Quality Oil and Gas MOU (USDI 2011) and allows for efficient air quality and AQRV impact analysis.

If additional modeling is performed after PGM is complete, an assessment of air quality and AQRV impacts would be made and, if necessary, additional mitigation measures may be identified.

6.0 Mitigation

Air quality and AQRV impact mitigation would involve two types of mitigation: 1) initial mitigation measures that become effective when the ROD is signed, and 2) enhanced mitigation measures that may be identified based on future ambient monitoring data or modeling results.

6.1 Initial Mitigation Actions

The following air quality mitigation measures would be applied upon issuance of the ROD through leasing documents and project-specific NEPA documents. To the extent practical, emission reductions associated with these mitigation measures have been included in the RMP/EIS emission inventory.

1. Design and construct roads and well pads to reduce the amount of fugitive dust generated by traffic or other activities. During construction activities, apply water, apply dust-suppression chemicals, apply gravel, or use other control methods to achieve 50 percent fugitive dust control efficiency, except when ground is wet or frozen.
2. Use water or other BLM-approved dust suppression during drilling, completion, and well workover operations for dust abatement on access roads, as needed, to achieve a 50 percent fugitive dust control efficiency, except when ground is wet or frozen.
3. Use water or other BLM-approved dust suppression in high traffic areas during production operations for dust abatement, as needed, to achieve 50 percent fugitive dust control efficiency, except when ground is wet or frozen. Operators will work with local government agencies to improve dust suppression on roads.
4. For oil and gas Project Plans of Development (PODs), oil and gas operators will establish speed limits for project-required unpaved roads in and adjacent to the project area; oil and gas operator employees will comply with these speed limits.
5. For oil and gas Project PODs, oil and gas operators will be encouraged to reduce surface disturbance, vehicle traffic, and fugitive dust emissions by consolidating facilities (e.g., using multi-well pads, storage vessels) when feasible.
6. Diesel drill rig and completion engines greater than 200 hp will meet Tier 4 emission standards for non-road diesel engines. Alternatively, oil and gas operators may use drill rig and completion engines that exceed Tier 4 emission standards if modeling or monitoring at the project level or programmatic level demonstrates compliance with the NAAQS and protection of AQRVs.
7. For hydraulically fractured gas wells that do not qualify as “low pressure wells”, “wildcat,” or “delineation” wells, oil and gas operators will comply with reduced emissions completion (REC) requirements specified in Subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission and Distribution (40 CFR §60.5375) within six months of ROD issuance.

8. Non-road diesel engines will be required to use ultra-low sulfur diesel fuel (15 ppmw) as required by 40 CFR §80.610(e)(3)(iii).

6.2 Monitoring-Based Mitigation

Enhanced mitigation would be evaluated and implemented if ambient monitoring data at monitors located in oil and gas activity areas within the planning area indicate that pollutant concentrations are approaching or threatening the NAAQS. If additional SD DENR monitoring stations are placed in oil and gas activity areas for the purpose of assessing air quality impacts from oil and gas activity, data from these stations would be included in ambient air quality assessments used to determine whether enhanced mitigation is needed.

Prior to completion of initial PGM, monitoring-based thresholds would be based on evaluation of exceedances of the NAAQS, as described in Section 6.2.1. After completion of initial PGM, monitoring-based thresholds would be based on BLM-calculated design values, as described in Section 6.2.3.

6.2.1 Monitoring-Based Thresholds before PGM Completion

Based on requests from USEPA during the MOU review process, the BLM would review NAAQS exceedances and determine if enhanced mitigation would be warranted during the interim period between ROD issuance and PGM completion. The BLM would require enhanced mitigation for BLM-authorized oil and gas activities if there is a monitored exceedance of the NAAQS at a monitor listed in Section 3.0, unless the BLM determines that enhanced mitigation is not warranted after completing specified steps as outlined below.

1. The BLM would notify the USEPA and SD DENR within 30 days after monitoring data showing an exceedance has been posted on USEPA's Air Quality System (AQS). The notification would state that the BLM is reviewing the exceedance according to this procedure.
2. After consulting with the SD DENR, the BLM would determine whether an exceptional event¹ may have caused the exceedance.
 - If the SD DENR informs the BLM that an exceptional event likely caused the exceedance, the BLM would provide a letter to that effect to the USEPA. No further action would be necessary.
 - If an exceptional event did not cause the exceedance or if SD DENR would not submit an exceptional event waiver to USEPA, the BLM would perform Step 3.
3. The BLM would conduct a screening level analysis² to determine the likely source and location of the exceedance and whether mitigation is needed.³
 - If the screening analysis indicates that the exceedance was not caused by BLM-authorized oil and gas source(s) within the planning area or indicates that the BLM-authorized oil and gas source(s) within

¹ The BLM would not formally decide that an exceptional event occurred as this decision would be made by the SD DENR. Until a final determination of an exceptional event is presented to USEPA by the SD DENR, and the USEPA has concurred, the BLM would assume that an exceptional event occurred based on a stated intention by the SD DENR to submit an exceptional event waiver.

² Publically available web based applications suggested by the USEPA to identify sources of air pollution and potential impacts include the following sites: trajectory analysis tools like HySplit (<http://ready.arl.noaa.gov/>), air quality data at the USEPA's AQS site (<http://airnow.gov/>), state regulatory agency sites and airnowtech.org, an interactive snow site (<http://www.nohrsc.nws.gov/interactive/html/map.html>), daily ozone modeling (<http://airquality.weather.gov/>), daily ozone and PM_{2.5} modeling site (<http://www.getbluesky.org/>), and daily satellite imagery site (<http://ge.ssec.wisc.edu/modis-today/>).

³ If data necessary to conduct a screening level analysis is not available, the BLM would consult with the SD DENR and the USEPA regarding source attribution and the need for mitigation.

the planning did not contribute to the exceedance, the BLM would convey this finding in writing to the SD DENR and USEPA for review and comment. No further action would be necessary.

- If the screening analysis indicates that the exceedance was caused or contributed to by BLM-authorized oil and gas sources inside the planning area, the BLM would perform Step 4.
- 4. The BLM would consult with the SD DENR and USEPA to determine whether there is a need for: 1) a refined attribution analysis (e.g., attribution test using CAMx ozone source attribution technology or anthropogenic precursor's culpability assessment) or 2) mitigation on BLM-authorized oil and gas emission sources within the planning area. If the refined analysis:
 - Is warranted, BLM would perform the refined analysis within 6 months of completing Step 3 in consultation with SD DENR and USEPA.
 - Indicates that the exceedance was not caused or contributed to by BLM-authorized oil and gas sources inside the planning area, the BLM would provide that recommendation to the SD DENR and USEPA for review and comment. No further action would be necessary.
 - Indicates that the exceedance was caused by BLM-authorized oil and gas sources within the planning area, the BLM would evaluate enhanced mitigation measures, as described in Section 6.2.2.

6.2.2 Determination of Enhanced Mitigation Measures before PGM Completion

If a NAAQS exceedance occurs prior to completion of PGM and the refined analysis in Step 4 above determined that the exceedance was caused by BLM-authorized oil and gas sources within the planning area, enhanced mitigation measures would be evaluated and selected by the BLM, in cooperation with the SD DENR and the AQTW, when appropriate. Preference would be given to mitigation methods that the SD DENR intends to impose as new regulations or air quality permitting provisions. Selected mitigation measures would be implemented within one year after the BLM decision to apply additional mitigation.

Potential enhanced mitigation measures include the measures listed below based on current information concerning potential emission reduction technologies. Additional measures or equivalent methods or emission restrictions may be identified in the future.

- Drilling and/or blowdown activity restrictions based on meteorological conditions
- Construction activity restrictions based on meteorological conditions
- Centralization of gathering facilities
- Electric drill rigs
- Field electrification for compressors and/or pumpjack engines
- Plunger lift systems with smart automation
- Oil tank load out vapor recovery
- VOC controls on tanks with a potential to emit less than 5 tons per year
- Selective catalytic reduction on non-drill rig stationary engines
- Reduced emission completions beyond those required by USEPA regulations, if determined to be technically and economically feasible
- Well pad density limitations
- Reducing the total number of drill rigs operating simultaneously
- Seasonally reducing or ceasing drilling during specified periods
- Using only lower-emitting drill and completion rig engines during specified time periods
- Using natural gas-fired drill and completion rig engines
- Replacing internal combustion engines with gas turbines for natural gas compression
- Employing a monthly forward looking infrared (FLIR) leak detection program to reduce VOCs
- Tank load out vapor recovery
- Enhanced VOC emission controls with 95% control efficiency on additional production equipment having a potential to emit of greater than 5 tons/year
- Enhanced direct inspection and maintenance program

6.2.3 Monitoring-Based Thresholds After PGM Completion

By May 31 of each year following completion of PGM, the BLM would calculate design values for each pollutant monitored at a federal reference monitor within the planning area and identified as a representative monitor in Section 3.0. The design value would be calculated based on calendar year monitoring data available at the time. Monitoring data from the appropriate prior period would be used. For example, based on PGM completion in summer 2015, the first annual design value calculation would be performed by May 31, 2016 and would include monitoring data for calendar years 2013, 2014, and 2015 for three-year design values and on monitoring data for calendar year 2015 for single-year design values.

Calculation methods would, to the extent possible, follow USEPA procedures provided in the following appendices within Title 40 of the Code of Federal Regulations (CFR), Part 50 in effect as of December 1, 2012. These procedures may be updated by future USEPA regulations and this section of the ARMP Air Resource Management Plan would be revised to reflect changing regulations.

- NO₂ (Appendix S)
- O₃ (Appendix P)
- PM₁₀ (Appendix K)
- PM_{2.5} (Appendix N)
- SO₂ (Appendix T)

Design values would be calculated on a site-specific basis (i.e., no spatial averaging of multiple monitors). BLM design value calculations would exclude data associated with exceptional events identified by SD DENR.

6.2.4 Determination of Enhanced Mitigation Measures After PGM Completion

If the air quality assessment described in Section 6.2.3 indicates that a BLM-calculated design value is greater than 85 percent of a NAAQS, one or more enhanced mitigation measures addressing that pollutant or pollutant precursor would be evaluated and selected by the BLM, in cooperation with the SD DENR and USEPA. The geographic extent of the mitigation measure(s) would be determined based on the analysis performed in Section 6.2.3. Potential enhanced mitigation measures include the measures listed above in Section 6.2.2, as well as additional measures that may be identified in the future. Selected mitigation measures would be implemented within 1 year after the BLM decision to apply additional mitigation.

6.3 Modeling-Based Mitigation

6.3.1 Modeling-Based Thresholds

Future modeling would assess air quality and AQRV impacts from future BLM-authorized oil and gas activity and would include regional PGM and project-specific modeling. Modeling-based thresholds for evaluating enhanced mitigation would include potential future impacts on NAAQS or impacts above specific levels of concern for AQRVs in Class I or sensitive Class II areas (as identified on a case-by-case basis by SD DENR or a federal land management or tribal agency).

6.3.2 Modeling-Based Enhanced Mitigation Measures

If BLM-authorized oil and gas activity is predicted to cause or contribute to impacts above the thresholds described above, the BLM would facilitate an interagency process to ensure that a comprehensive strategy is developed to manage air quality impacts from future oil and gas development within the region. The local, state, federal, and Tribal agencies involved in the regulation of air quality and the authorization of oil and gas development would evaluate modeling results from future modeling studies and identify potential air quality concerns and necessary reductions in air emissions. If the modeling predicts significant impacts, these agencies would use their respective authorities to implement enhanced emission control strategies, operating limitations, equipment standards, and/or pacing of development as necessary to ensure continued compliance with applicable ambient air quality standards, including the enhanced mitigation measures listed in Section 6.2.2, other future mitigation measures identified through BLM's adaptive management strategy, or reasonable mitigation measures suggested by the SD DENR or AQTW. If necessary, implementation of mitigation measures would occur within one year of obtaining final modeling results for mitigation measures that conform to currently implemented land use planning decisions and constraints.

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Appendix R

Rights-of-Way and Renewable Energy Avoidance or Exclusion Areas

	<i>Analysis Area</i>	<i>Management Decision</i>
Streams, floodplains, water bodies, wetlands, reservoirs & riparian areas		Avoidance – All types of ROWs
Sensitive soils (includes slopes over 25%).		Avoidance - All types of ROWs
Badland and rock outcrops		Avoidance – All types of ROWs
Fisheries reservoirs with fisheries	0.25 mi. buffer	Avoidance - All types of ROWs
Pallid and shovel-nosed sturgeon	0.25 mi. buffer	Avoidance – All types of ROWs
Bighorn sheep habitat		Avoidance - All types of ROWs
Big game wintering areas		Avoidance – All Types of ROWS
Prairie dog colonies		Avoidance – All types of ROWs
Black-footed ferret		Exclusion – All types of ROWs
Greater sage-grouse wintering areas		Exclusion – Renewable Energy ROWs.
		Avoidance - Other types of ROWs
Sharp-tailed grouse/greater prairie-chicken brood rearing/nesting areas	2 mi. buffer	Avoidance - All types of ROWs

	<i>Analysis Area</i>	<i>Management Action</i>
Interior least tern & piping plover	0.25 mi. from habitat	Avoidance- All types of ROWs
Peregrine falcon aerie	0.5 mi. buffer	Exclusion – Renewable Energy ROWs
		Avoidance – Other types of ROWs
Bald eagle nests	0.5 mi. buffer	Exclusion – Renewable Energy ROWs
		Avoidance – Other types of ROWs
Raptor nests (Does not include bald eagles & peregrine falcons)	0.25 mi	Exclusion – Renewable Energy ROWs
		Avoidance – Other types of ROWs
Greater sage-grouse PHMAs		Exclusion – Renewable Energy ROWs
		Avoidance – Other types of ROWs
Greater sage-grouse leks in GHMAs	1.0 mi buffer	Exclusion – Renewable Energy ROWs
	2.0 mi buffer (Minor ROWs only)	Avoidance – Other types of ROWs
Greater sage-grouse brood rearing/nesting habitat outside of PHMAs (in GHMAs)	2 mi. buffer	Avoidance – All types of ROWs
Greater sage-grouse general Habitat (GHMAs)	Entire GH area	Avoidance for renewable energy ROWs. Open for other ROWs except leks, brood rearing & nesting habitat as described above.

	<i>Analysis Area</i>	<i>Management Action</i>
Sprague's pipit	Sprague's Pipit habitat	Avoidance – All types of ROWs
Colonial nesting water birds	¼ mi. of nesting colonies	Exclusion -All types of ROWs
	½ mi. of nesting colonies	Exclusion Renewable Energy ROWs. Avoidance for other ROWs
VRM	Class 2	Exclusion – Renewable Energy ROWs
		Avoidance – Other types of ROWs
Fort Meade ACEC outside the ROW corridor		Exclusion - All types of ROWs
Fossil Cycad ACEC		Exclusion - All types of ROWs
National Register Historic Trails	½ mile buffer from Missouri River Corridor	Exclusion– Renewable Energy
		Avoidance other types of ROWs
Fort Meade SRMA buffer only (Fort Meade ACEC addresses the interior area)	½ mile buffer	Exclusion – All types of ROWs
Exemption Area SRMA and SRMA buffer	½ mile buffer	Exclusion – Renewable Energy ROWs
		Avoidance – Other types of ROWs

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Appendix S

Summary of Restrictions Table

Summary of Restrictions		
The restrictions listed below are condensed summaries of the restrictions. Refer to Section 3 for specific details		
Key ACEC: Area of Critical Environmental Concern CSU: Controlled Surface Use Stipulation NSO: No Surface Occupancy Stipulation	O&G: Oil and Gas ROWs: Rights-of-Way TL: Timing Limitation Stipulation	Note: Subsurface acres include federal mineral estate below BLM-administered surface estate and federal mineral estate below lands of other surface ownerships (split-estate).
Open designations may be subject to site- or project-specific restrictions determined at the project level (implementation) environmental review.		
Resource and Resource Use	Management Decision	
Air Resources		
O&G Emissions from nonroad engines—Tier 4 engines (low emission engines)	CSU: Tier 4 engines would be required for oil and gas drilling and completion activities as follows: Tier 4 nonroad diesel engines, or the engine emits NO _x at rates less than or equal to EPA emission standards for Tier 4 nonroad diesel engines (Refer to Appendix G).	
Soil and Water		
O&G stipulation within perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas.	NSO within perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas. Surface: 13,397 acres Subsurface: 63,426 acres	
	CSU: Surface occupancy and use would be controlled within 300 feet of perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas. Surface: 17,090 acres Subsurface: 82,745 acres	
ROWs restriction within perennial or intermittent streams, lakes, ponds, reservoirs, 100-year floodplains, wetlands, and riparian areas.	ROWs avoidance Surface: 14,191 acres	
O&G stipulation within source water protection areas	NSO: Surface occupancy and use is prohibited within State-designated Source Water Protection Areas.	
ROWs restriction within source water protection areas	ROW avoidance in State-designated Source Water Protection Areas.	
O&G stipulation on sensitive soils	CSU Surface: 122,725 acres Subsurface: 719,649 acres	
	ROWs avoidance Surface: 144,171 acres	
O&G stipulation on badland formations and rock outcrops	NSO: Surface occupancy and use is prohibited on badlands and rock outcrop. Surface: 21,575 acres Subsurface: 136,146 acres	
ROWs restriction on badlands and rock outcrops	ROWs avoidance Surface: 24,222 acres	

Summary of Restrictions		
The restrictions listed below are condensed summaries of the restrictions.		
Refer to Section 3 for specific details		
Key ACEC: Area of Critical Environmental Concern CSU: Controlled Surface Use Stipulation NSO: No Surface Occupancy Stipulation		Note: Subsurface acres include federal mineral estate below BLM-administered surface estate and federal mineral estate below lands of other surface ownerships (split-estate).
O&G: Oil and Gas ROWs: Rights-of-Way TL: Timing Limitation Stipulation		
Open designations may be subject to site- or project-specific restrictions determined at the project level (implementation) environmental review.		
Resource and Resource Use	Management Decision	
Invasive Species		
Some exceptions would apply to the following restrictions (refer to Weeds Section of Table 2-6).		
Herbicide weed treatments in or near special status plant species	Listed T&E and sensitive plant species would have a 100 foot herbicide buffer zone, applied by spot treatment unless broadcast treatment would not have adverse impacts to such species.	
Herbicide weed treatments near active raptors nests (including SSS, and bald eagle nests)	No weed treatments from 3/1-8/1 within ¼ mile raptor nest that are currently occupied from March 1-Aug. 1.	
Herbicide weed treatments near Greater Sage-Grouse leks within General Habitat Management Areas (GHMA)	TL: Spot treatments only within 3 miles of sage-grouse leks from March 1-June 30 in GHMAs.	
Herbicide weed treatments in Greater Sage-Grouse Priority Habitat Management Areas (PHMA)	Spot treatments in PHMAs only, using IPM methods within suitable nesting or brood rearing habitat of known sage-grouse leks from March 1 – June 30. This does not apply to areas outside of PHMAs.	
Wildlife		
O&G stipulation on bighorn sheep habitat	NSO Surface: 788 acres Subsurface: 58,072 acres	
ROWs restrictions in bighorn sheep habitat	ROWs avoidance Surface: 875 acres	
Livestock grazing in bighorn sheep habitat	Closed to domestic sheep and goat grazing within 15 miles of bighorn sheep range. Surface: 9,292 acres	
O&G stipulation for colonial-nesting waterbirds (refer to Wildlife section of Table 2-2 for a list of species)	NSO: Surface occupancy and use is prohibited within ¼ mile of waterbird nesting colonies.	
	TL: Surface use is prohibited within ½ mile of waterbird nesting colonies from April 1 through July 15.	
ROW restrictions for colonial-nesting waterbirds (refer to Wildlife section of Table 2-2 for a list of species)	<u>Renewable energy ROWs</u> : Exclusion ½ mile of nesting colonies.	
	<u>Other types of ROWs</u> : Avoidance ½ mile of nesting colonies.	
O&G stipulation on or near raptor nest sites active within the preceding 7 years (does not include bald eagle, peregrine falcon, or special status species)	NSO: ¼ mile of nest.	
	Surface: 544 acres Subsurface: 3,059 acres	
	TL: Surface use is prohibited within ½ mile of active raptor nest sites from March 1 through July 31. Surface: 2,258 acres	

Summary of Restrictions		
The restrictions listed below are condensed summaries of the restrictions.		
Refer to Section 3 for specific details		
Key		Note: Subsurface acres include federal mineral estate below BLM-administered surface estate and federal mineral estate below lands of other surface ownerships (split-estate).
ACEC: Area of Critical Environmental Concern	O&G: Oil and Gas	
CSU: Controlled Surface Use Stipulation	ROWs: Rights-of-Way	
NSO: No Surface Occupancy Stipulation	TL: Timing Limitation Stipulation	
Open designations may be subject to site- or project-specific restrictions determined at the project level (implementation) environmental review.		
Resource and Resource Use	Management Decision	
	Subsurface: 13,674 acres	
ROWs restriction on or near other raptor nest sites active within the preceding 7 years (does not include bald eagle, peregrine falcon, or special status species)	Renewable energy ROWs: Exclusion ¼ mile from nests.	
	Surface: 657 acres	
	Other types of ROWs: Avoidance ¼ mile from nests.	
	Surface: 657 acres	
O&G stipulation on big game wintering areas	CSU: Within wintering areas.	
	Surface: 106,382 acres Subsurface: 411,150 acres	
ROWs restriction in big game wintering areas	ROWs avoidance Surface: 121,406 acres	
O&G stipulation on or near sharp-tailed grouse/greater prairie-chicken breeding/brood rearing/nesting habitat	CSU: 2 miles from sharp-tailed grouse/greater prairie-chicken leks.	
	Surface: 1,316 acres Subsurface: 15,373 acres	
ROWs restriction on or near sharp-tailed grouse/greater prairie-chicken breeding/brood rearing/nesting habitat	ROWs avoidance 2 miles from sharp-tailed grouse/greater prairie-chicken leks	
	Surface: 1,366 acres	
	New power lines would be sited and designed in a manner which does not impact sharp-tailed grouse or greater prairie-chickens within 2 miles of leks.	
Special Status Species		
O&G stipulation in Black-footed ferret habitat	NSO: Surface occupancy and use is prohibited within ¼ mile of black-footed ferret habitat	
ROWs restriction in Black-footed ferret habitat	ROWs exclusion within habitat	
O&G stipulation in prairie dog habitat	CSU: Within prairie dog colonies. Surface: 2,806 acres Subsurface: 6,378 acres	
ROW restriction in prairie dog habitat.	ROWs avoidance within prairie dog colonies Surface: 2,862 acres	
O&G Stipulation for Pallid and Shovel-nosed Sturgeon	NSO: Surface occupancy and use is prohibited within ¼ mile of the waters edge (high water mark) of the Missouri River and its reservoirs	
ROWs restriction for Pallid and Shovel-nosed Sturgeon	ROWs avoidance within ¼ mile of the waters edge (high water mark) of the Missouri River and its reservoirs	
O&G stipulation for Sprague’s pipit	Lease Notice stating that mitigation may be required on all parcels with potential habitat. Migratory Bird Treaty Act Lease notice would also apply.	
ROWs restriction for Sprague’s pipit	ROWs avoidance in areas identified as high to moderate potential for Sprague’s pipit habitat	

Summary of Restrictions <i>The restrictions listed below are condensed summaries of the restrictions.</i> <i>Refer to Section 3 for specific details</i>		
Key ACEC: Area of Critical Environmental Concern CSU: Controlled Surface Use Stipulation NSO: No Surface Occupancy Stipulation	O&G: Oil and Gas ROWs: Rights-of-Way TL: Timing Limitation Stipulation	<i>Note: Subsurface acres include federal mineral estate below BLM-administered surface estate and federal mineral estate below lands of other surface ownerships (split-estate).</i>
Open designations may be subject to site- or project-specific restrictions determined at the project level (implementation) environmental review.		
Resource and Resource Use	Management Decision	
O&G stipulation in interior least tern nesting habitat	NSO: ¼ mile from identified habitat (specific habitat not identified but potential exists)	
ROWs restrictions in interior least tern nesting habitat	ROWs exclusion ¼ mile from identified habitat (specific habitat not identified but potential exists)	
O&G stipulation in piping plover nesting habitat	NSO: ¼ mile from identified habitat (specific habitat not identified but potential exists)	
ROWs restriction in piping plover nesting habitat	ROWs exclusion ¼ mile from identified habitat (specific habitat not identified but potential exists)	
O&G stipulation on or near peregrine falcon aeries (applies to aeries active within past 7 years)	NSO: 1 mile of aeries	
ROWs restriction on or near peregrine falcon aeries (applies to aeries active within past 7 years)	<u>Renewable Energy ROWs</u> : Exclusion within ½ mile of aeries	
	<u>Other types of ROWs</u> : Avoidance within ½ mile of aeries	
O&G stipulation on or near bald eagle nest sites active within the preceding 5 years	NSO: ½ mile. Surface: 0 acres Subsurface: 259 acres	
ROWs restriction on or near bald eagle nest sites active within the preceding 5 years	<u>Renewable Energy ROWs</u> : Exclusion within ½ mile of nests	
	<u>Other types of ROWs</u> : Avoidance within ½ mile of nests	
O&G stipulation on or near special status raptor nests active within 7 years (bald eagles and peregrine falcon addressed in separately)	NSO: ¼ mile of nest.	
	Surface: 499 acres Subsurface: 7,510 acres	
	TL: 3/1-7/31 within ½ mile of nest Surface: 1,837 acres Subsurface: 10,636 acres	
ROWs restriction on or near special status raptor nests (bald eagles and peregrine falcon addressed separately)	<u>Renewable Energy ROWs</u> : Exclusion within ¼ mile of nests	
	Surface: 554 acres	
	<u>Other types of ROWs</u> : Avoidance within ¼ mile of nests Surface: 554 acres	
O&G and Geothermal stipulation on Greater Sage-Grouse PHMAs	NSO (applies to O&G and Geothermal) Surface: 123,594 acres Subsurface: 405,849 acres	

Summary of Restrictions <i>The restrictions listed below are condensed summaries of the restrictions.</i> <i>Refer to Section 3 for specific details</i>		
Key ACEC: Area of Critical Environmental Concern CSU: Controlled Surface Use Stipulation NSO: No Surface Occupancy Stipulation	O&G: Oil and Gas ROWs: Rights-of-Way TL: Timing Limitation Stipulation	<i>Note: Subsurface acres include federal mineral estate below BLM-administered surface estate and federal mineral estate below lands of other surface ownerships (split-estate).</i>
Open designations may be subject to site- or project-specific restrictions determined at the project level (implementation) environmental review.		
Resource and Resource Use	Management Decision	
ROWs restriction on Greater Sage-Grouse PHMAs	<u>Renewable Energy ROWs</u> : Exclusion	
	Surface: 127,735 acres	
	<u>Other types of ROWs</u> : Avoidance Surface: 127,735 acres	
Locatable, salable and other leasable minerals other than oil, gas and geothermal development in Greater Sage-Grouse PHMAs (Other leasable minerals includes all leasable minerals except oil, gas and geothermal which are addressed separately)	Development and exploration of locatable minerals would be open subject to adequate mitigation measures and conservation actions for sage-grouse and other sagebrush obligate species. Leasable minerals (other than oil, gas and geothermal and commercial salable mineral permits) would be closed. Salable minerals closed except for free use permits. Surface: 127,735 acres Subsurface: 412,822 acres	
Oil and Gas (O&G and geothermal) stipulation on or near Greater Sage-Grouse leks within GHMAs	NSO: 6/10 mile from sage-grouse leks. This restriction applies to O&G and geothermal development. Surface: 76 acres Subsurface: 170 acres	
ROWs restriction on BLM surface on or near Greater Sage-Grouse leks within GHMAs Note: Other ROW restrictions for nesting/brood rearing habitat would also apply (see below).	<u>Renewable energy ROWs</u> : Exclusion 1 mile of leks (114 acres of surface) and avoidance in other portions of the GHMA (23,570 acres of surface).	
	<u>Other types of ROWs</u> : Avoidance for Major ROWs (powerlines \geq 100kV and pipelines \geq 24 inches) throughout the entire GHMA. Surface: 23,684 acres Avoidance for Minor ROWs 2 miles of leks (801 acres of surface). Other portions of the GHMA would be open to minor ROWs (22,883 acres of surface).	
O&G, Geothermal stipulation on Greater Sage-Grouse brood rearing/nesting habitat within GHMAs	CSU: 2 miles from sage-grouse leks within GHMAs. This restriction applies to O&G and geothermal development. Surface: 784 acres Subsurface: 7,840 acres	
ROWs restriction on Greater Sage-Grouse brood rearing/nesting habitat within GHMAs	<u>Renewable energy ROWs</u> : Exclusion within 1 mile of leks (114 acres of surface) and avoidance in other portions of GHMA (23,570 acres of surface).	

Summary of Restrictions		
The restrictions listed below are condensed summaries of the restrictions.		
Refer to Section 3 for specific details		
Key		Note: Subsurface acres include federal mineral estate below BLM-administered surface estate and federal mineral estate below lands of other surface ownerships (split-estate).
ACEC: Area of Critical Environmental Concern	O&G: Oil and Gas	
CSU: Controlled Surface Use Stipulation	ROWs: Rights-of-Way	
NSO: No Surface Occupancy Stipulation	TL: Timing Limitation Stipulation	
Open designations may be subject to site- or project-specific restrictions determined at the project level (implementation) environmental review.		
Resource and Resource Use	Management Decision	
	<u>Other types of ROWs:</u> Avoidance for Major ROWs (powerlines ≥ 100kV and pipelines ≥ 24 inches) throughout the entire GHMA. Surface: 23,684 acres Avoidance for Minor ROWs within 2 miles of leks (801 acres of surface). Other portions of the GHMA would be open to minor ROWs (22,883 acres of surface).	
CSU – Bury or modify fiber optic, telephone, or power lines – Greater Sage-Grouse GHMAs, PHMAs and within Greater Sage-Grouse winter range	All new power lines within 2 miles of sage-grouse leks in GHMAs, PHMAs, and within sage-grouse winter range would be buried provided the lines can be safely buried. Acres affected vary depending on site specific circumstances.	
O&G, Geothermal stipulation on Greater Sage-Grouse wintering areas (includes areas within PHMAs and GHMAs)	NSO: Greater sage-grouse crucial wintering areas. Includes Geothermal development. Surface: 50,791 acres Subsurface: 103,553 acres	
ROWs restriction on Greater Sage-Grouse wintering areas (includes areas within PHMAs and GHMAs)	<u>Renewable Energy ROWs:</u> Exclusion within crucial winter range Surface: 53,144 acres	
	<u>Other types of ROWs:</u> Avoidance within crucial winter range Surface: 53,144 acres	
Fisheries		
O&G stipulation in areas within ¼ mile of sport fish reservoirs	NSO Surface: 551 acres Subsurface: 12,548 acres	
ROWs restriction within ¼ mile of sport fish reservoirs.	ROWs avoidance Surface: 1,018 acres	
Cultural		
Leasable minerals and O&G stipulation on Bear Butte Surface: 0 acres Subsurface: 410 acres	Closed This restriction applies to O&G and geothermal development.	
Locatable minerals on Bear Butte Surface: 0 acres Subsurface: 410 acres	Recommended for withdrawal from locatable mineral entry	
Salable minerals on Bear Butte Surface: 0 acres Subsurface: 410 acres	Closed	

Summary of Restrictions		
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Key		Note: Subsurface acres include federal mineral estate below BLM-administered surface estate and federal mineral estate below lands of other surface ownerships (split-estate).
ACEC: Area of Critical Environmental Concern	O&G: Oil and Gas	
CSU: Controlled Surface Use Stipulation	ROWs: Rights-of-Way	
NSO: No Surface Occupancy Stipulation	TL: Timing Limitation Stipulation	
Open designations may be subject to site- or project-specific restrictions determined at the project level (implementation) environmental review.		
Resource and Resource Use	Management Decision	
Leasable minerals (including O&G) stipulation on National Scenic and Historic Trails (NSHT).	NSO: Within ½ mile of the National Trail Management Corridor of designated NSHTs. For the Lewis and Clark NHT this would include the Missouri River and its reservoirs and ½ mile from the high water mark of the Missouri river and its reservoirs.	
ROWs within ½ mile of the designated National Trail Management Corridor of National Scenic and Historic Trails (NSHT) For the Lewis & Clark NHT this would include the Missouri River and its reservoirs and ½ mile from the high water mark of the Missouri river and its reservoirs.	<u>Renewable energy ROWs</u> : Exclusion within ½ mile of NSHT	
	<u>Other types of ROWs</u> : Avoidance within ½ mile of NSHT	
Leasable Minerals (including O&G) stipulations on Cultural properties determined to be of importance to Native American Tribal groups, sites determined to be Traditional Cultural Properties, and/or designated for traditional use.	NSO	
Mineral exploration and development at the abandoned Black Hills Army Depot (BHAD) Surface: 0 acres Subsurface: 11,899 acres	Closed to leasable and salable minerals (including O&G). Open, with restrictions applicable to locatable minerals, limited to the prevention of unnecessary or undue degradation (UUD).	
Abandoned townsite of Igloo (Does not include BHAD) Surface: 0 acres Subsurface: 903 acres	NSO for leasable minerals (including O&G). Closed to salable minerals. Open to locatable minerals.	
Visual Resources		
CSU O&G stipulation on VRM Class II designation	CSU: VRM Class II criteria would apply to 1,544 acres in Fort Meade and Fossil Cycad ACECs.	
ROW restriction on VRM Class II designation	<u>Renewable Energy ROWs</u> : Exclusion Surface: 1,544 acres	
	Other types of ROWs: Avoidance Surface: 1,544 acres	

Summary of Restrictions		
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Refer to Section 3 for specific details		
Key		Note: Subsurface acres include federal mineral estate below BLM-administered surface estate and federal mineral estate below lands of other surface ownerships (split-estate).
ACEC: Area of Critical Environmental Concern	O&G: Oil and Gas	
CSU: Controlled Surface Use Stipulation	ROWs: Rights-of-Way	
NSO: No Surface Occupancy Stipulation	TL: Timing Limitation Stipulation	
Open designations may be subject to site- or project-specific restrictions determined at the project level (implementation) environmental review.		
Resource and Resource Use	Management Decision	
Recreation		
O&G stipulation in or near SRMAs	NSO: In and within ½ mile buffer of Exemption Area SRMA.	
	NSO: Within ½ mile buffer around Fort Meade SRMA.	
	Surface: 5,078 acres Subsurface: 8,839acres	
Locatable and leasable minerals in or near SRMAs	Locatable minerals would be withdrawn and leasable minerals would be closed within the Fort Meade SRMA.	
	Surface: 6,574 acres Subsurface: 6,574 acres	
ROWs restriction on Fort Meade SRMA, buffer only (Fort Meade ACEC addresses the interior area)	Renewable Energy ROWs: Exclusion within ½ mile	
	Other types of ROWs: Avoidance within ½ mile	
Surface: 0 acres		
ROWs restriction on Exemption Area SRMA and SRMA buffer	Renewable Energy ROWs: Exclusion within SRMA and ½ mile	
	Other types of ROWs: Avoidance within SRMA and ½ mile	
Surface: 5,078 acres		
Camping	Restricted to 16 days	
Motorized Cross Country Travel to Access Campsites (does not include Fort Meade)	Allowed within 300 feet of roads to access campsite by direct route	
Motorized cross-country travel to retrieve downed big game animals	Not allowed	
Travel with Motorized Vehicles Equipped to Travel Over Snow (does not include administrative or emergency use)	Not allowed at Fort Meade. This type of travel is limited to designated roads and trails in the Exemption Area and could be restricted in other areas through subsequent travel management planning.	
OHV Travel (does not include administrative or emergency use)	The planning area would be designated as a ‘OHV Limited Area’, except for the Fort Meade and Fossil Cycads ACECs which would be ‘OHV Limited to Designated Routes’. The OHV limitation for the planning area would ultimately be to “OHV Limited to Designated Routes” as determined through a subsequent implementation/activity level Travel Management Plan(s). In the interim OHV use on existing routes may occur, however no new routes may be created without specific authorization.	
Firearm Shooting	No discharge of firearms in southern portion of Fort Meade ACEC	
	Surface: 3,996 acres	

Summary of Restrictions		
The restrictions listed below are condensed summaries of the restrictions. Refer to Section 3 for specific details		
Key ACEC: Area of Critical Environmental Concern CSU: Controlled Surface Use Stipulation NSO: No Surface Occupancy Stipulation	O&G: Oil and Gas ROWs: Rights-of-Way TL: Timing Limitation Stipulation	Note: Subsurface acres include federal mineral estate below BLM-administered surface estate and federal mineral estate below lands of other surface ownerships (split-estate).
Open designations may be subject to site- or project-specific restrictions determined at the project level (implementation) environmental review.		
Resource and Resource Use	Management Decision	
Travel and Transportation Management		
Summary of travel and transportation management restrictions	Motorized travel limited to designated routes. Existing roads and trails will be considered designated routes until such time as an area-specific Travel Management Plan is completed and specific routes are identified and designated. Oversnow motorized vehicles prohibited in Fort Meade ACEC. Oversnow motor vehicles may be restricted in future Travel Management Plan decisions. Motorized travel off-road greater than 300 feet from the road for campsite location is prohibited.	
ACECs		
Summary of ACECs and acres protected by ACEC Designation	Two ACECs: Fort Meade and Fossil Cycad Surface: 6,894 acres Subsurface: 6,894 acres	
Leasable minerals (including O&G and geothermal) on Fort Meade ACEC	Closed Surface: 6,574 acres Subsurface: 6,574 acres	
ROWs restriction on Fort Meade ACEC	Utility and transmission line ROWs would be allowed (open) in the designated ROW corridor in the Fort Meade ACEC Surface: 1,066 acres	
	ROWs exclusion outside ROW corridor Surface: 5,508 acres	
Locatable minerals on Fort Meade ACEC	Withdrawn from locatable mineral entry Surface: 6,574 acres Subsurface: 6,574 acres	
Salable minerals on Fort Meade ACEC	Closed to salable minerals Surface 6,574 acres Subsurface: 6,574 acres	
Leasable minerals (including O&G and geothermal) Fossil Cycad ACEC Surface: 320 acres Subsurface: 320 acres	Closed This restriction applies to O&G and geothermal development.	
ROWs restriction on Fossil Cycad ACEC	ROWs exclusion Surface: 320 acres	
Other leasable minerals on Fossil Cycad ACEC	No Lease (Closed) Subsurface: 320 acres	
Locatable minerals on Fossil Cycad ACEC	Withdrawn from mineral entry Surface: 320 acres Subsurface: 320 acres	

Summary of Restrictions		
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Key ACEC: Area of Critical Environmental Concern CSU: Controlled Surface Use Stipulation NSO: No Surface Occupancy Stipulation	O&G: Oil and Gas ROWs: Rights-of-Way TL: Timing Limitation Stipulation	Note: Subsurface acres include federal mineral estate below BLM-administered surface estate and federal mineral estate below lands of other surface ownerships (split-estate).
Open designations may be subject to site- or project-specific restrictions determined at the project level (implementation) environmental review.		
Resource and Resource Use	Management Decision	
Salable minerals on Fossil Cycad ACEC	Closed	
	Surface: 320 acres Subsurface: 320 acres	
Hazardous Materials and Cultural Resources		
U.S. Air Force abandoned Minuteman missile sites	CSU: Within 1/8 mile (approximately 200 meters) of U.S. Air Force abandoned Minuteman missile sites	
Mineral exploration and development at the abandoned Black Hills Army Depot (BHAD) Surface: 0 acres Subsurface: 11,899 acres	Closed to leasable and salable minerals (including O&G). Open, with restrictions applicable to locatable minerals, limited to the prevention of unnecessary or undue degradation (UUD), as defined in 43 CFR 3715 and 43 CFR 3809.5. Additional requirements beyond unnecessary or undue degradation UUD are voluntary and achieved by negotiation with the claim holder. Required design features would not be mandatory, and would be implemented within the limits of the mining laws.	